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VETERINARY MEDICINE

February 1935

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Junior FORT DODGE BIO-CHEMIC REVIEW

FEBRUARY 1935

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Veterinary Medicine

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, R.K.O. Bldg., New York, Eastern Representative

Pneumonia in lambs often develops following exposure and chilling. It cannot be successfully treated; the thing to do is to prevent it.

* * * *

Jankiewicz and Scofield found that chicks become effectively resistant and in some cases totally immune to further infection with *Eimeria tenella,* the cause of cecal coccidiosis, through the capsule feeding of three doses of oocysts at five-day intervals.

* * * *

The condition known as stiffs or sweeny in cattle is caused primarily by a shortage of phosphorus in the forage consumed. Affected animals show a subnormal content of inorganic phosphorus in the blood plasma, a condition which was alleviated by consumption of bone meal.

* * * *

Agriculture, so depressed at the present time, the bankrupt plight of which we read every day in our daily papers, is the backbone of every civilized country, and the wealth of agriculture lies in its animals. The livelihood of the farmer depends on the health of his animals, and the health of the animals depends on the only man who is trained to recognize the deviations from normal, that is, the qualified veterinarian; for it is only upon a foundation of good health and the control of epizootics amongst animals that the pastoral industries can be successfully developed.—*F. T. G. Hobday.*

Two cc of a formolized spleen emulsion of cats in the last stages of infectious gastroenteritis, injected subcutaneously into a kitten, and repeated after five days, will protect it when exposed to the disease.

* * * *

An ointment composed of cod liver oil, zinc oxide, chlorine, lanoline, and vaseline has been recommended for use by veterinarians as a protective for the arms before removing the fetal membranes from cows that have aborted. It possesses the advantage that it does not liquefy at body temperature.

* * * *

What is the governing power that induces animals to select certain foods? We have been in the habit of calling it instinct—which in itself requires definition — but a recent most interesting investigation carried out by Harris, Clay, Hargreaves and Ward would discredit the "instinct" hypothesis, and attribute food selection to something far more prosaic, educational experience.

* * * *

Papi obtained urine from a heifer and from two pregnant cows. Ten cc of filtered acidified urine from each of these animals was then injected intravenously into three young rabbits. After 72 hours the rabbits were killed. Those animals which had received urine from the pregnant cows showed small hemorrhages in the ovaries, an increase in the size of the Graafian follicles and hyperemia of the uterus. The urine from the heifer produced no changes.

Blowflies are well-known pests in that they not only enter human dwellings and lay their eggs in foodstuffs, but also in human and animal tissues. The genus Lucilia (sub-family Calliphorinae) contains two species of major importance. *L. sericata* lays its eggs in soiled wool, etc., of sheep in Australia, South Africa, and the British Isles; in China it commonly lays its eggs in bacterially infected human tissues. *L. cuprina* also lays its eggs in soiled wool in Australia, where it is a widely distributed inland species; in India, and to some extent in Africa, it lays its eggs in diseased human and animal tissues. These two species, therefore, fall into the group of semispecific myiasis producing flies, in that, though normally breeding in decaying carcasses, etc., they will also lay their eggs in decomposing human and animal tissues. This habit is correlated with the structure of the ventral wall of the pharynx of the larva, which is in each case ribbed, proving that they are not true parasites, but necrobiots.—*Annales Trop. Med. and Paras.* 28(1):107-121.

* * * *

In the case of myiasis of sheep, the female *Lucilia sericata* is attracted by the odor emanating from what has been loosely termed "soiled" wool, that is, wool harboring bacteria which cause the fibers of the wool to disintegrate. This will lead later to decomposition of the skin scales. Once the larvae are established in close contact with the skin, this becomes infested and dermatitis develops and extends rapidly.

The various lesions in the breach, crutch, and tail of sheep, and the so-called sweaty conditions, "pizzle" disease, etc., are pathological processes in which decomposition is taking place, with the production of much dead tissue from which the attracting odor emanates. As the infestation and decomposition extends, further destruction of the tissues is accelerated by rubbing and scratching, etc., until large foul-smelling wounds are produced; this is a common condition in Lancashire, England.—*Annales Trop. Med. and Paras.* 28(1):107-121.

* * * *

Certain evidence indicates that exercise of the defense mechanism by inoculation with heterologous antigens increases the resistance of experimental animals to the subsequent action of various infectious agents or toxic substances.—*Pub. Health Rept.* 48:22.

* * * *

It seems probable that the increased resistance occasioned by one antigen or infection is the result of a mobilization, strengthening, and training of the defense mechanism, thus rendering it more prompt and effective in its efforts to combat other subsequent infections.

* * * *

Experiments have shown that blood transfusion between animals of the same and of different species may be safely undertaken. Horse blood is the most suitable for transfusion into both man and lower animals. Accidents are usually the result of injecting the blood too rapidly.—*The Vet. Bul.* 4:5.

* * * *

The sanitary care with which certified milk is produced is emphatically reflected in the finished products as delivered to the consumer by the almost complete absence of organisms which produce gas and those which are proteolytic. Tests show the great superiority of certified milk in these respects to all other milks.—*Med. Times* 41:12.

* * * *

Experiments carried out by the Veterinary Division of the University of Minnesota show that ammonium thiocyanate (a weed exterminator) is quite toxic for animals, especially for cattle. It is more toxic than sodium chlorate. On the other hand the substance is repulsive to cattle and undoubtedly they do not consume it under ordinary conditions.

* * * *

Horses, treated with carbon disulphide to rid them of bots, should be given further protection by destroying the bot eggs on the legs. The protection consists of mopping over the parts of animals bearing bot eggs with a cloth dipped either in a 2% aqueous carbolic acid solution, or in a 2% aqueous creolin solution, or in undiluted white oil emulsion.—Uni. of Ill., Agric. Exp. Sta.

One of the most effective methods of ridding the dog of fleas is to wash him with a 3% solution of creolin. This not only kills the fleas but promotes the healing of scratches and leaves the hair in good condition. With cats which have a more tender skin, a 2% solution should be used.—Conn. Agr. Exp. Sta. Cir. No. 97.

* * * *

Die Hundewelt reports that the Secretary of Agriculture of Hungary has issued an order that all dogs over three months of age, used for herding purposes, must be inoculated against rabies each year not later than the first of March. The owners of the animals have to bear the cost, and infringements of the order will be punished with a considerable fine.—*Dogdom.*

* * * *

The minimum protein requirements for the maintenance of animals, an important point in feeding, may now be predicted from their body weights by a simple and accurate method, apparently quite generally applicable. This accuracy of prediction is comparable to the accuracy with which the basal metabolism of men and women can be predicted from the equation of Benedict and Harris involving age, height, and weight.—Univ. of Ill., Agric. Exp. Sta. 46th annual report.

* * * *

Of 379 Holstein pregnancies resulting in normal calvings, conception took place at the first service in 58.8%, at the second service in 21.1%, at the third service in 10.3%, at the fourth in 4.2%, at the fifth in 2.4%, and for the remainder after a larger number of services; one cow conceived at the 15th service. The average for the total number of pregnancies was 1.87 services per conception. There were 340 pregnancies among Jerseys resulting in normal calvings. Of this number 65.6% conceived at the first service, 24.1% at the second, 6.1% at the third, 1.7% at the fourth, and the remainder at a larger number of services; the greatest number being 6. The average was 1.53 services per conception.—Ohio Agr. Exp. Sta. *Bimonthly Bul.* 19(166) :8-14.

Two virgin test heifers, negative to the blood test for Bang's abortion, were slaughtered five weeks after being bred to a bull. One of these heifers had conceived. Bacteriological examination of the uterus and the embryo revealed a hemolytic streptococcus. Then, the bull was slaughtered. The right testicle proved to be infected with organisms which appeared identical with those isolated from the heifer. This hemolytic streptococcus organism is very similar to those found in mastitis and certain other infectious diseases of animals.

* * * *

Results of experiments indicate that the strain of bovine *Br. abortus,* avirulent for guinea-pigs, or the virulent swine strain, when administered to sows and heifers, three to five and one-half months before service, affords only slight protection against repeated exposure to *Br. abortus* as compared with that induced by the virulent bovine strain. When given after conception, the avirulent bovine strain seemed to increase resistance to the progress of the disease, and the swine strain appeared to give a definite immunity. The latter strain, however, is likely to infect the udder for long periods, and it is generally believed to be more dangerous to human health than the bovine. Hence, its use for vaccinating cattle is out of the question.—W. E. Cotton in *Jour. Agr. Res.* 45(12) :705-724.

* * * *

It has been amply proved that hog cholera is a disease of hogs and hogs only. In the majority of cases, if infection reaches the hog lot, it comes there in a live hog, sick with the disease, or in infected pork scraps fed to hogs. The majority of the outbreaks occur in fall months, when the farm meat house is empty and before the weather is cold enough for farm slaughter. It is obvious, therefore, that most farmers purchase their hog cholera troubles either in the form of live hogs, or dressed meat. A little care then in feeding and management will prevent the bulk of our hog cholera outbreaks, and save much worry as to where next winter's meat supply is coming from.—*Mark Welsh.*

Prevention of rickets in calves can be effected by supplying vitamin-D supplements like cod liver oil or viosterol, by ultraviolet radiation from artificial sources, or by exposure to the ultraviolet rays of the sun. Still, another source is good legume suncured hay. Calves that eat liberally of good alfalfa or clover hay will seldom develop rickets according to the studies made by Rupel, Bohstedt, and Hart of Wisconsin.

The Bureau of Biological survey now administers 102 wild-life refuges, two new ones having been added during the year 1933-34. Most of these are within continental United States, though some are in Alaska, Hawaii, and Puerto Rico. Six have been established primarily as big-game preserves, one in Alaska for reindeer and caribou experiments, and one in Alaska for muskrats and beavers. The others are bird refuges, and all six of the big-game preserves also have been designated as bird refuges.

Sore eyes may occur in lambs. As soon as this condition is noticed, the eyes should be washed twice daily with a saturated solution of boric acid and then treated with a 15% solution of argyrol applied with a medicine dropper. Some cases of conjunctivitis are very persistent, and treatment needs to be continued for a considerable time. Turned in eyelids will cause keratitis. These sometimes correct themselves, but in very severe cases they need to be stitched back or held back with adhesive tape. Basically the condition is believed to be of nutritional origin.

The result of experiments carried out at the Michigan Agricultural Experiment Station indicates that the destruction of endospores in the milk by the use of electropure is not entirely due to the heat created in the medium surrounding the endospores, but also to another factor, namely, the heat generated within the endospores. Also, the temperature attained within the endospores is probably greater than that of the surrounding medium.

A simple method of examining milk samples for the detection of mastitis bacteria consists in the incorporation of gentian violet in the liver infusion agar to inhibit other groups of bacteria that may be present This allows the streptococci to grown unhindered. —*Amer. Jour. Pub. Health 22:749-752.*

"No-lesion" reactors have caused considerable confusion in the past. Recent investigations have given confirmatory evidence indicating that when but one animal in a herd reacts to the tuberculin test, it is safe to leave this animal in the herd for six months until a retest is made, provided all the animals in the herd had previously been found non-reactors.—Univ. of Wis. Bul.

During October last, 1,805,202 cattle were tuberculin tested in the cooperative bovine tuberculosis eradication project and 49,932 reactors removed from the herds under official supervision and slaughtered. Testing was conducted in all the 48 states. Minnesota ranked first with 260,791 tested. In New York 209,078 were tested; in Iowa 186,871; in Missouri 119,691, and in California 53,570 cattle were tested during October.

Minnesota Becomes Modified Accredited Area

In recognition of Minnesota's success in eradicating bovine tuberculosis the U. S. Department of Agriculture has designated the state as a modified accredited area. This designation signifies that the state has reduced the degree of infection in all its cattle to one-half per cent or less.

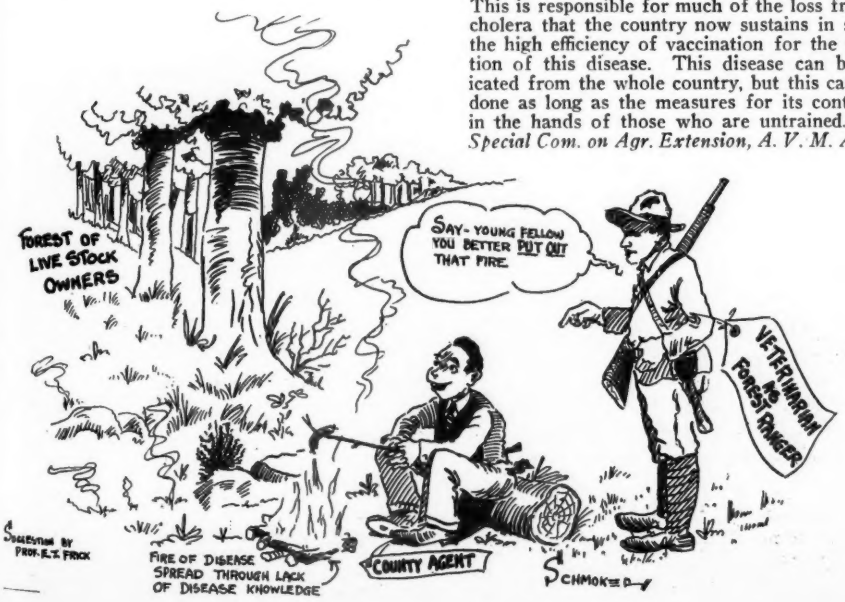
Minnesota is the eighteenth state to have won the distinction of federal recognition because of its practical freedom from bovine tuberculosis. The other states are North Carolina, Maine, Michigan, Indiana, Wisconsin, Ohio, Idaho, North Dakota, Nevada, New Hampshire, Utah, Kentucky, West Virginia, Washington, Illinois, Oregon and Virginia.

Achievements of Veterinarians

Veterinarians have developed the serum-simultaneous treatment for the prevention of hog cholera that makes the present swine industry possible. Without this development the shipping of feeder pigs for fattening, the exhibition of swine at shows and fairs, the great dispersal sales of pure-bred animals and general traffic in swine would be unsafe and impractical. In reality this treatment is a proved necessity to the livestock industry, yet it may constitute a serious menace. The virus used in the simultaneous treatment is the causative agent of hog cholera which may either cause the disease or immunize animals against it. To use this product properly the administrator must be educated and trained in such subjects as Pathology and Bacteriology in order that he may be familiar with the symptoms and manifestations of all livestock diseases and in addition he must be highly specialized in biological therapy. Without such technical education the administrator is certain to use this treatment when some disease other than cholera is present or when the treatment is otherwise contra-indicated. When this is done the operator causes new centers of infection and widespread dissemination of the disease with resultant severe losses to the owners. Practically all regulatory and scientific organizations recognize that the veterinarian is the only person whose education and experience qualifies him to use anti-hog cholera serum and virus and such organizations are on record to that effect.

Veterinarians spend four to five years studying all branches of medicine to properly qualify them for such work; yet in many instances county agents and extension workers who are totally untrained and uneducated in these subjects are competing with qualified veterinarians in the vaccination of swine. These men are attempting to extend to farmers scientific knowledge which they, themselves, do not possess; as representatives of the State and Federal Government and paid with the funds of those agencies they compete with qualified veterinarians, but worse: they use with abandon and ignorance a product which instead of immunizing actually spreads the disease. It is even worse when these untrained county agent workers place such deadly instrumentalities in the hands of the farmers generally and encourage the farmers to do their own vaccinating.

Veterinarians are under a legal and professional responsibility to report outbreaks of hog cholera to regulatory officials and to use their professional knowledge in preventing the spread of the same. County agents and extension workers have no such professional or legal responsibility and in many instances not only fail to report such centers of infection, but actually cover up outbreaks of cholera which they themselves have started. This is responsible for much of the loss from hog cholera that the country now sustains in spite of the high efficiency of vaccination for the prevention of this disease. This disease can be eradicated from the whole country, but this cannot be done as long as the measures for its control are in the hands of those who are untrained.—*Rept. Special Com. on Agr. Extension, A. V. M. A., 1933.*


FOREST OF LIVE STOCK OWNERS
SAY- YOUNG FELLOW YOU BETTER PUT OUT THAT FIRE.
VETERINARIAN AS FOREST RANGER
COUNTY AGENT
FIRE OF DISEASE SPREAD THROUGH LACK OF DISEASE KNOWLEDGE
SUGGESTION BY PROF. E. T. FRICK
SCHMOKER

The Dog Food Code Authority Acts

Readers of this magazine will not need to be told in detail that the dog food industry has been, and is, one of the most chaotic industries in which veterinarians, as such, are concerned, nor that no industry has more badly needed reorganization and revamping, or at least reforming and house cleaning than this one.

It was hoped that a code of fair practices might be adopted under the provisions of the National Industrial Recovery Act and efforts to that end were made immediately upon the enactment of that law. Readers will recall that little progress was made for months and not until nearly a year after many other industries had adopted codes, was one adopted by the canned dog food industry.

When the code was adopted and became effective, June 11, 1934, the code authority asked for and was granted a period of 90 days to establish "reasonable definitions and reasonable standards of identity and biological value for canned dog food, necessary to prevent deception, fraud and unfair competition in the sale of canned dog food," and to present to the NRA administrator recommended standards and a plan for their enforcement.

The "90 days" were stretched to six months and at last, the code authority has made the following report:

ARTICLE I

Other Federal Acts

Section 1. This report shall not be construed or applied to interfere with the authorized administration and enforcement of the federal food and drugs act, as to dog food.

Section 2. This report shall not be construed or applied to interfere with the authorized administration of the federal meat inspection acts, relating to dog food.

ARTICLE II

Definitions

Section 1. As used in this report—

(a) The term "canned dog food" means any product sold or offered for sale as a dog food, in canned form.

(b) The term "Code" means the Code of Fair Competition for the Dog Food Industry.

(c) The term "Report" means this report.

(d) The term "Authority" means the Code Authority of the Dog Food Industry.

(e) The term "Council" means the Scientific Council for the Dog Food Industry authorized by Article V of the Report.

(f) The term "Administration" means the Natonal Recovery Administration.

(g) The term "Association" means the National Dog Food Manufacturers' Association.

(h) The term "person" includes a partnership, corporation or other business entity.

Section 2. In executing this report the definitions duly promulgated for the administration and enforcement of the federal food and drugs act and the federal meat inspection acts, respectively, shall be used, if and to the extent they are applicable and appropriate.

ARTICLE III

Definitions and Standards of Identity and Biological Value

Section 1. Canned dog food may consist of any edible substance or of any combination of edible substances, which is fit and suitable for use as a dog food.

Section 2. No canned dog food shall contain (a) any substance which is unfit for use in a dog food, because it is unwholesome or injurious; or (b) any substance which is unsuitable for use in a dog food, for any sufficient reason; or (c) any substance which has no reasonably justified use in a dog food; or (d) any amount of a substance which is either deceptively inadequate or injuriously or deceptively excessive in the circumstances.

Section 3. No canned dog food shall contain (a) any harmful preservative or coloring; or (b) any coloring effective to deceptively conceal its condition or to misrepresent its identity, character or composition.

Section 4. Canned dog food shall have the biological and nutritive value (a) represented by its dog food name or designation; or (b) alleged for it upon its label or in its advertisement or otherwise in its sale. No statement or representation shall be made regarding the value or effect of a canned dog food, unless such statement or representation is supported by evidence sufficient to justify it.

Section 5. Canned dog food shall be true to its name and to all descriptive statements made upon its label or in its advertisement or otherwise in its sale.

ARTICLE IV

Labeling Requirements

Section 1. The label of canned dog food shall plainly and correctly state—

(a) the name of such food; and

(b) the name and address of the manufacturer or other person primarily responsible for its sale; and

(c) its net weight, measure or numerical count, as the case may be; and

(d) its ingredients properly described and listed; and

(e) its percentage content of protein, fat and fiber, respectively; and

(f) directions for feeding.

Section 2. No label of canned dog food shall contain—

(a) any false or misleading statement or representation whatever; or

(b) any negative disclaimer as to its composition; or

(c) any statement or representation which is or may be effective to induce its human consumption, such as "Fit for Human Food" or "Fit for Human Consumption."

ARTICLE V

Plan of Enforcement

Section 1. Because of the scientific character of Articles III and IV of the Report and for the purpose of assuring their due enforcement in the public and industrial interest the Authority is empowered to create and maintain a "Scientific Council for the Dog Food Industry," subject to approval by the Association and the Administration. The Authority is also empowered to establish a control laboratory for the Council, operated by it in pursuance of a plan approved by the Association, Authority and Administration.

Section 2. The Council shall consist of five (5) members qualified to serve upon it and no one of whom shall be engaged in the dog food business. The membership of the Council shall include (a) an experienced authority upon canine nutrition, who shall be chairman; (b) an experienced expert in the general field of nutrition; (c) an experienced expert in food chemistry; (d) a representative of the profession of veterinary medicine affiliated with an accredited American college of veterinary medicine; and (e) a representative of the United States government, if available, or, if not available, a suitable representative of the public at large.

Section 3. The Council shall act as a scientific referee and research agency advisory to the Authority. The Council shall have the powers prescribed by the Authority and approved by the Association and Administration. Such powers shall include—

(a) the power to investigate scientific questions presented by Articles III and IV of the Report, respectively,—for the advice of the Authority; and

(b) the power to determine whether canned dog food violates or complies with the aforesaid Articles, respectively, upon the basis of data submitted to it or secured by it,—for the advice of the Authority; and

(c) the power to prescribe standards and methods for determining whether canned dog food violates or complies with the aforesaid Articles, respectively,—for the advice of the Authority; and

(d) the power to prescribe conditions under which canned dog food violates or complies with the aforesaid Articles, respectively,—for the advice of the Authority; and

(e) the power to promulgate regulations for its procedure, approved by the Authority and Administration.

Section 4. The Authority shall publish all formal reports to it by the Council.

Section 5. If and when the Council reports to the Authority that a canned dog food violates either Article III or Article IV of the Report, then the Authority shall take the compliance or enforcement action indicated in the circumstances.

Section 6. If and when the Council reports to the Authority that a canned dog food complies with both Articles III and IV of the Report, then the manufacturer or other person primarily responsible for the sale of such food may use in its sale a plain or emblematic statement reading, "Approved by the Scientific Council for the Dog Food Industry," in the form and subject to the conditions prescribed and approved by the Authority.

IN MANY respects the report is commendable and the long delay in making it the more regrettable on that account. The establishment of a "Scientific Council for the Dog Food Industry" is an excellent, constructive piece of work, praiseworthy in all respects. The provision for the personnel of this council is entitled to unstinted commendation. It offers a prospect of improved conditions.

The good to be accomplished under any code depends almost wholly upon the integrity, ability and earnestness of the Code Authority. The foregoing plan is both broad and conservative and its very general terms are such as to permit slipshod enforcement in the hands of an indifferent Code Authority. It is to be noted that the scientific council is merely an advisory body (it could not well be otherwise), whose recommendations the Code Authority may accept, reject or disregard. Therefore, it may be repeated that very much now depends upon the attitude of the Code Authority.

Because of the long delay in accepting a code of fair practices, indicating a lack of sympathy on the part of many elements in the industry, and the long delay of the Code Authority in preparing the foregoing plan, which may indicate any one of several things, veterinarians will withhold judgment in the matter and watch the administration of the code in a spirit of hopefulness if not as yet with complete confidence. The dog food industry may well be on the way to correcting flagrant abuses, winning back the confidence of dog owners which it has lost, and establishing for itself a field of greater magnitude than any it has yet experienced, and again, it may not. The year and a half of unnecessary delay during which conditions have gone from bad to

worse, is now behind us. If the improvement in the practices of the industry, which is easily possible of being brought about under the provisions of the plan now adopted, materializes promptly, we shall forget the delay as speedily. Otherwise, our hopes for improvement in the canned dog food field must depend for fulfillment upon the enactment of the Copeland bill or some modification of it.

Bang's Disease Testing a Cattle Reduction Program

Many veterinarians have been active in procuring from cattle owners signed agreements for the Bang's disease test of their herds under funds provided by the LaFollette amendment to the Jones-Connally Act and all readers are, of course, familiar with the present plan for carrying out this testing. It seems worthwhile, however, to offer a word of caution against referring to this plan as one of Bang's disease control or eradication.

In making the allotment of funds for this work, the AAA referred to it as "Emergency cattle disease control," and the initial allotment of three million dollars was "For Bang's disease control." Nevertheless, the plans, so far as announced, provide for cattle reduction and not for Bang's disease control. Whether or not, the program may develop into one of disease control or eradication depends upon questions that at present no one can answer. The eagerness of cattle owners to have their herds tested seems to indicate that they are under the impression that by this means they are going to attain Bang's disease free herds, and if this goal is not attained some one is going to be censured.

The veterinary profession has, in no instance, up to the present, failed to control or eradicate any disease of animals where the project was entrusted to it. It is important that it do not now permit itself to be put in a position where it may be criticized for failure to control or eradicate Bang's disease under the present program.

As to whether or not a cattle reduction program is necessary or advisable, does not concern veterinarians as such. Since cattle reduction has been decided upon, it is better, of course, other things being equal, to remove diseased animals from herds than to remove the healthy, and in this removal veterinarians can supply a highly useful service.

The removal of positive reactors to the blood test for Bang's disease, is only the first step in eliminating the malady from herds. Frequent retests and rigid herd management are both vital to the successful program and are not provided for under the present plan, or any plans it is practical to make under the present appropriations. No plan of Bang's disease control or eradication has yet received official endorsement in this country that is practical for more than a minority of the herds in any state. It is unlikely that simply adding to the plans already tried an indemnity for cattle condemned, will make any of them generally practical in commercial dairies.

It is true, under the present plan, the cattle owner who signs the agreement to have his cattle tested for Bang's disease is "expected" to continue the testing at his own expense after emergency funds are no longer available, and it is true he is "expected" to follow out a rigid system of herd management, selection of replacements, isolation of parturient animals, etc., but disease and particularly Bang's disease, is not so easily controlled. Expectations must materialize because of adequate authority for enforcement or a desire on the part of the herd owner, neither of which are provided for under the present plan.

In states having Bang's disease control projects already under way, the work will doubtless receive a new impetus as a result of the emergency testing, and in herds where it is practical, considerable progress will no doubt be made; but for the remainder and that is the majority, the present Bang's disease testing program out of emergency funds is simply and only a cattle reduction program, and a wise one in that reduction is accomplished by the removal of diseased animals.

The Physiology of Hydrocyanic Poisoning

Prussic acid, hydrogen cyanide, or hydrocyanic acid (HCN) is a cellular poison, as are also the salts of that acid. These cyanogen compounds injure by blocking the oxidization of the tissues. The treatment is to block the toxic action with agents that have an affinity for the CN radical and transform it into an inoffensive combination forthwith. It is with this object that glucose was employed against poisonings due to a toxic quantity of prussic acid in certain forage plants. It was intended to transform the poisonous cyanide into a methemoglobin. But its action alone was not rapid enough in serious intoxications although effective against subacute injury such as ensues from a continuous intake of sub-lethal doses.

For the more acute forms of the accident, sodium nitrite or thiosulphite, or preferably both, accomplish the same purpose and do so immediately following their intravenous administration. The nitrite is especially indicated (Hug, *Presse Medicale,* No. 30, 1934) because of its rapid and powerful antidotal action. The thiosulphate acts the same but somewhat slower and in larger doses. The thiosulphite is, however, the less offensive as an intravenous medication. Both of them unite with the poison to form the inoffensive methemoglobin which is quickly eliminated.

The dosage, computed with considerable care in human medicine, is 5 to 10cc of a 2% solution of the nitrite, and 10 to 20cc of a 30% solution of the thiosulphate. It is recommended that these solutions, freshly made, be given separately one immediately following the other. The question of stability of prepared solutions is problematic but not insoluble according to current opinions. The thiosulphate (hyposulphite) is the more stable of the two. The nitrite tends to change into an antidotally inert nitrate on exposure to water or the moisture of the air, and unless employed in a form where the unstability has been taken into account, its action is ineffective against cyanogen poisonings.

Injuries from cyanogen compounds are becoming more and more numerous, for various reasons. The feeding of mixed feeds and the unknowns lying in new types of roughage (soybean hay, sweet clover hay, Sudan hay, lespedeza, shredded corn fodder, etc.), various kinds of molasses (cane, sugar beet), linseed and cotton seed cake, harvested, cured and stored under different conditions, are matters to be reckoned with in veterinary clinical work of the present time, for in addition to the recognizable accidents manifested by sudden illness or fatalities, there appears to be subclinical cases of prussic acid injuries of no little importance in animal production which are yet to be clarified.—L. A. M.

* * * *

Raw Bone

This mineral supplement much used in stock foods is a packing house by-product prepared by tanking the bones at moderate temperature to remove the adhering meat and the fat. They are then cracked to the desired size or ground finely. Some preparations possess a disagreeable odor and are refused by farm animals, particularly dairy cows, but in other respects this product is wholesome.

* * * *

Decreased Horses, Increased Surplus

The decrease in horses and mules which in round numbers is about 10 million head, has thrown 40 million acres of land into the production of surplus farm commodities. This is more than the acreage required to produce our exports of wheat, corn, rye, barley, and oats, even in the years of their greatest exports since 1920. It would have produced all the cotton harvested in 1932, with 4 million acres left over. It would have produced more than 70% of all the wheat raised in the United States in 1932. It is more than the total acreage of all harvested crops in 1929, in the eleven most western states of the United States; and it is more than the

total acreage of all crops harvested in 1929 in Tennessee, North and South Carolina, Georgia, Alabama and Mississippi.—Wayne Dinsmore.

Ultimate Consumers

There are but two ultimate consumers. These are man and the horse. Other animals, cattle, sheep, swine and all poultry are but food factories, converting pasture, hay, forage and grains into more concentrated, more palatable and more easily digested form for man.

When either of these ultimate consumers decrease, surplus begins to accumulate. Horses and mules have been decreasing in numbers since 1920, and as acreage in harvested crops has increased enough since then to care for the increase in human population, it follows that the decrease in horses and mules has meant an increase in surplus farm products. This has been accumulating steadily, at an increasing rate, ever since 1920, and is the major factor determining the low prices for farm products.—Wayne Dinsmore.

X-Ray Treatment of Goitre

By X-ray treatment in non-toxic goitres, a marked reduction of the goitre is accomplished. This is nearly identical to a complete cure.

X-ray treatment is indicated in all parenchymatous goitres, even if they should cause compression.

X-ray treatment combined with iodine inunctions results in a quick and safe cure and leads more rapidly to success than any other therapy.

Hard, knotty and cystic goitres are more difficult to manage. If operation is contraindicated, the combined treatment of X-ray and iodine inunction should be tried.

This combined treatment of parenchymatous goitre has at least the same good results as an operation, 85.5% being cured. Harmful effects are never seen, provided that the right technique is applied.—*Phar. Advance.*

Court Decisions on Public Health

Bovine tuberculosis statute held valid.—(Illinois Supreme Court[87]; *People* v. *Anderson,* 189 N. E. 338; decided Feb. 23, 1934) The defendant, who had refused to permit his cattle to be tested for tuberculosis by officials of the Illinois Department of Agriculture, was charged with violating section 2 of the State bovine tuberculosis eradication law.

A jury found the defendant guilty and a fine was imposed. From this judgment the defendant appealed to the supreme court, contending, among other things, that section 2 of the act in question was violative of the State constitution and of the fourteenth amendment to the Federal Constitution.

The defendant's first contention of this character was that he was entitled to notice before any attempt was made by the department to test his cows and that the provisions of the act violated the due process of law provision of the Constitution. With regard to this the court said:

* * * The destruction or sequestration of animals or food injurious to public health is a matter that requires urgent and prompt action. Delay only increases the opportunity for further harm to the public. The nuisance created by the keeping of cattle suffering from tuberculosis is a continuing one and a constant source of danger. Summary action is necessarily required to meet the exigencies of the situation. Public measures dealing with the protection of the lives and health of the people warrant the immediate seizure and destruction of property dangerous to the lives and health of those consuming it. Tubercular cattle fall within this category. [Cases cited.] The due process rule is not a limitation upon the right of the State to exercise its power unless the attempted exercise is arbitrary or unreasonable or an improper use of such power. [Cases cited.] Due process of law does not necessarily mean judicial proceedings in some court of competent jurisdiction. [Cases cited.] Summary seizure and destruction without a hearing do not violate the due process clause of the Federal Constitution. [Cases cited.]

The second contention was that the law was unconstitutional in delegating to the department the power to make tuberculin tests or to have them made, but the court

[87]Publ. Health Rep'ts., 49:33.

disposed of this point adversely to the defendant, saying:

* * * The legislature had the power to pass a law upon the subject of the suppression of tuberculosis in dairy and breeding cattle. As a necessary adjunct to such power it had the right to adopt a procedure for the administration of such law. It had the lawful right to invest the department with certain discretion to be exercised by it, acting through its agents, in the discharge of its functions as a ministerial and administrative agency. The powers granted were neither judicial nor legislative. [Cases cited.] There was no constitutional violation by the powers granted to the department by the act.

The final objection raised against the validity of the law was that the act's provision that the livestock owner "shall provide necessary facilities for making tests and render such assistance as may be required by the department" was too broad in conferring powers upon the department and was unconstitutional, indefinite, and uncertain. The court saw no merit in this objection and, in deciding against it, used the following language:

* * * If such clause were invalid, it would not render the whole act unconstitutional. The crux of the act providing for the owner of dairy and breeding cattle to submit them to the tuberculin test would still remain in force. The provision for assistance and facilities at the request of the department is only incidental to the purpose of the act. It is not shown by the record that the department has promulgated any unreasonable or arbitrary rules under this power. The defendant was not injured by the provisions of the act providing for assistance and facilities. He did not base his refusal to have his cows tested upon the arbitrariness or unreasonableness of any requirement of the department for the administration of the act or any demand that he furnish assistance or facilities in making the test, but refused, under any circumstances, to have his cattle tested. Until he was hindered, affected, or prejudiced by the attempt of the department to enforce this provision of the act, he is in no position to complain. * * *

After citing several cases upholding acts containing provisions requiring things to be done in and about their enforcement, the court went on to say:

* * * Under the authority of these cases the provision for assistance on the part of the owner and the furnishing by him of facilities is not unconstitutional; neither does the act vest unreasonable and unrestricted power in the department, nor is the act indefinite and uncertain.

In bringing to a close its consideration of the defendant's contentions challenging the constitutionality and validity of the statute, the court declared that "The act does not violate any of the State or Federal constitutional provisions urged against it and is a valid act."

Additional decisions.—Two other cases involving the bovine tuberculosis law were also decided by the Illinois Supreme Court on February 23, 1934. These were *People ex rel. Kerner, Atty. Gen., et al.* v. *Huls,* 189 N. E. 346 and *Witte et al.* v. *McLaughlin, Director of Department of Agriculture,* 189 N. E. 350. In the first-mentioned case the court (1) adhered to the conclusions reached in the Anderson case as to the constitutionality of the law; (2) held that the use of the verb "submit," in that part of section 2 which provided that the owners "shall submit their cattle for a tuberculin test upon request of the department of agriculture," did not render the law indefinite and uncertain, as "submit," taken in connection with the context, had a well-defined meaning, namely, "to present for determination"; and (3) held that an injunction proceeding could be brought to restrain the defendant from refusing to submit his cattle to the tuberculin test and from interfering in any manner with the State department of agriculture and its agents in making the test.

In the second-named case, which was a suit to restrain the State department of agriculture and its agents from enforcing or attempting to enforce the law, the court again said that the statute was not violative of the provisions of the State or Federal constitutions in respect to any of the charges made against it nor was it an oppressive and unwarranted use of the police power of the State.

* * * *

Bone Ash

When bones are burned with free access of air they burn to a grayish white mass which is easily powdered. This ash is somewhat higher in lime and phosphorus than the raw bone or steamed bone meal. It is a suitable source of lime and phosphorus for animal feeds.

Livestock Raising Safer—Scientists Reduce Risks

Noteworthy gains in scientific knowledge having practical application in the livestock industry are described by the chief of the Bureau of Animal Industry, in his annual report. The report also summarizes a wide range of inspection work and special activities performed in connection with agricultural adjustment and drought relief.

In commenting on the shipment, last summer, of approximately a million cattle

Dr. John R. Mohler, Chief, Bureau of Animal Industry, U. S. Department of Agriculture.

from drought-affected areas to southern pastures, Doctor Mohler emphasizes the basic importance of disease-control measures, which the Bureau has conducted for many years, by stating that those southern pastures would not have been safe for these cattle but for the eradication of cattle tick and the deadly fever which it transmits. Besides the release, from Federal quarantine, of 13,208 additional square miles of territory formerly ticky, material gains against other diseases and pests are reported.

The average incidence of bovine tuberculosis throughout the country was reduced to a new low mark of 1.1 per cent as compared with more than 4 per cent at the beginning of eradication work. More than two-thirds of all counties, the report states, had either completed the practical eradication of bovine tuberculosis or are actively engaged in this important undertaking. Bang's disease, or infectious abortion, gained recognition during the year as an emergency activity project. This malady, which long has been the cause of heavy losses to cattle owners, is now being combated vigorously by federal veterinary forces cooperating with state and local officials and livestock owners. Dourine and glanders are reported to be practically eradicated among domestic stock and attention is now centering on the possibility that a few wild or semiwild range animals may still be affected.

Favorable results reported from the use of the rapid, stained-antigen test for diagnosing pullorum disease, a method developed by Bureau scientists for removing a serious drawback to poultry raising. Success in keeping the United States free of foot-and-mouth disease and other serious maladies that hamper stock raising in certain other countries are also reported. Many other encouraging developments, largely of technical and scientific nature but giving promise of practical use, indicate increasing mastery over risks from disease and injurious parasites.

Research in genetics, animal nutrition, and livestock management likewise proved fruitful by providing stockmen with further knowledge concerning breeding principles and economical methods of production. In studies of meat quality, results showed the particular value of good pastures as a part of the ration of cattle and lambs.

Experiments with swine indicated feedlot weights of about 225 pounds are associated with maximum quality of the resulting pork, including tenderness, flavor, and richness of juice. With further fattening of hogs improvement ceased or the quality of the pork declined slightly.

Record-of-performance studies showed wide variations in the ability of food an-

imals to utilize feed and convert it economically into meat and other products. The results show the desirability of selecting breeding stock on the basis of performance of their offspring. This procedure is considered the key to the development of superior strains within breeds.

An improved basis for advancement in sheep breeding is the use of fiber-measuring devices recently developed by Bureau investigators for determining the characteristics of wool and other animal fibers.

In horse investigations, a superior type of utility-saddle stock has been produced by crossing selected animals of the Thoroughbred and Morgan breeds. A Thoroughbred-Percheron cross has given a promising new type of draft animal. The purpose of these studies is the development of systems of mating that produce horse stock most suitable for present-day general utility, pleasure, and farm-power requirements.

Besides these and other developments underlying stock raising, Doctor Mohler reports results of numerous inspection activities. Federal meat inspection included the veterinary examination of more than 77,500,000 food animals, the great majority of which were found to be healthy. Besides conducting meat inspection services for the War and Navy Departments, Marine Corps, Coast Guard, Federal hospitals and other Government institutions, the Bureau of Animal Industry examined large numbers of animals for the Civilian Conservation Corps and those slaughtered in connection with agricultural-adjustment activities and for various relief agencies.

Procedures in administering the packers and stockyards act with respect to the maintenance and improvement of orderly livestock marketing also are presented in text and in statistical tables.

In conducting the wide range of activities outlined, the Bureau has followed the policy of allocating its personnel so as to maintain continuity of regular work, at the same time having groups of trained employes in readiness for emergencies and other special needs.

New Zoological Laboratory Dedicated

More than 100 guests attended the dedication services of the new Zoological Laboratory building which has been completed recently at the Beltsville Research Center, Beltsville, Md. Dr. Maurice C. Hall, chief of the Zoological Division of the Bureau of Animal Industry, presided and several guests gave short talks. Among the speakers were: Dr. Cooper Curtis, who was the first member of the division and is now retired; Dr. Charles Wardell Stiles, who served as chief of the division, and Dr. Albert Hassall, who until his recent retirement was assistant chief. These men discussed the early work of the Bureau in research and procedures for the eradication and control of animal parasites, and stressed the possibilities which the new building and equipment provide for additional investigations.

Other speakers were Dr. Henry B. Ward, permanent secretary of the American Association for the Advancement of Sciences; Dr. W. E. Cotton, superintendent of the Bureau of Animal Industry Experiment Station at Bethesda, Md.; Dr. Lawrence A. Avery, superintendent of the new laboratory, and Earl C. Butterfield, newly appointed superintendent of the Beltsville Research center. Other guests represented Johns Hopkins University, the Helminthological Society of Washington, the Smithsonian Institution, and various branches of the Department of Agriculture.

The building cost $50,000 and contains 31 rooms. It will be used for experimental work in the control and eradication of parasites. Several other buildings accommodate small animals such as dogs, cats, guinea pigs, rabbits, chickens, pigs and others. The special equipment includes a variety of apparatus, a post-mortem room, refrigerator room, incinerator, and library. The lots and pens outside these buildings are separated by double fences and ditches to prevent contamination from other pens. Special equipment is provided also for the disposal of manure from pens where parasitized animals are being kept. There are also small oil

moats in some cases, to insure isolation of animals in certain types of experiments.

The laboratory building and other small buildings were designed by Dr. Lawrence A. Avery, who also planned the landscaping of the adjacent grounds in such a way as to utilize as much of the native topography and native shrubbery as possible. A ravine which lies at some distance from the buildings has been utilized by simulating a zoological park with pens and shelters for dogs that will be kept for experimental purposes.

The dedicatory exercises were held Oct. 24, 1934.

Livestock Industry of Future

Identification, through record-of-performance work, of out-standing types of meat-producing animals and the development of superior strains within breeds will probably be an important phase of livestock improvement in the near future. This prophecy was made by Dr. John R. Mohler, Chief of the Bureau of Animal Industry, in addressing the Aberdeen-Angus Breeders Association at its Golden Jubilee at Chicago, December 3.

"The development of superior domestic animals is closely connected with Federal and State research work conducted in various parts of the country," Doctor Mohler said. "The ideal type of beef animal probably will become more closely associated, in the future, with ideal characteristics for beef and veal as judged by trade and consumer preferences. This no doubt will involve practical applications of knowledge supplied by the science of genetics.

"The sale of high quality beef under its breed name is another possibility in beef-cattle improvement. The same idea is already a reality in the case of some other food products, such as fruit, vegetables, eggs, and milk. In the case of meat, the breed identity could be maintained by suitable labeling or designation by reliable dealers."

Referring to livestock health, Doctor Mohler anticipated a reduction of losses from the present $40 annual toll that the average farm sustains through inroads of diseases, pests, and similar causes. He pointed out that the eradication of cattle ticks is already about 90 per cent complete and bovine tuberculosis has been reduced to less than one-third its prevalence of 15 years ago. The evidence supplied by the federal meat-inspection service and official field surveys indicates that other livestock diseases are being reduced throughout the country. Doctor Mohler paid tribute to the telephone, telegraph and radio as adjuncts to veterinary science in aiding in the prompt control of outbreaks of animal disease.

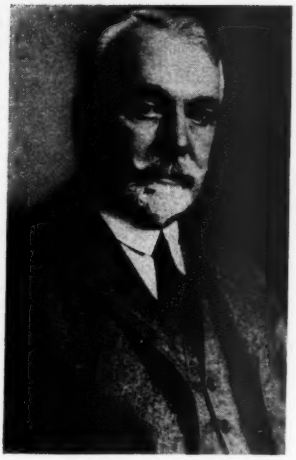
Commenting on developments in livestock marketing, Doctor Mohler said that federal legislation involving supervision of livestock transportation and central markets has already led to materially improved conditions and savings to producers. He expressed the opinion that public support of Government efforts in this direction would bring about further betterment of the marketing structure.

Cattle Tick Quarantined Area Reduced

Additional progress in eradicating cattle ticks from sections in the South still infested with this disease-carrying pest is shown in an order signed by M. L. Wilson, Acting Secretary of Agriculture, effective December 1, 1934. The order releases from federal quarantine 12,756 square miles of territory in Florida and Louisiana. This progress is the result of the systematic dipping campaign by state and federal agencies cooperating with cattle owners of these sections during the active tick-eradication season this year.

The existing quarantine in the State of Texas and the Territory of Puerto Rico is continued. The area under federal quarantine is now reduced to 11 counties in west-central Florida, 24 parishes west of the Mississippi River in Louisiana, and 36 counties in the southern and eastern parts of Texas.

Professor Hutyra Dead



Professor Franz von Hutyra

Veterinarians throughout the world mourn the death of Hofrat Doctor Franz von Hutyra, which occurred at his home in Budapest Dec. 20, 1934, after an illness of three years duration. Professor Huytra was perhaps the most distinguished member of the veterinary profession and had received most of the honors within the gift of the profession. His life and his work were an inspiration to veterinarians everywhere. One of the greatest disappointments to American veterinarians, in connection with the International Veterinary Congress in New York last summer, was the inability of Professor Hutyra, owing to his illness, to attend. Long had they hoped to see and to hear and to greet him to whose teaching they owe so much.

Franz von Hutyra was born at Szepeshely, Hungary, in 1860. He was graduated from the University of Budapest (M. D.) in 1883. After four years as assistant in the pathological institute, he went to the Budapest Veterinary Institute as adjunct teacher of pathological anatomy, and in this period qualified for a diploma of veterinary physician. In 1888 he was appointed associate professor and took up the directorship of the medical clinic together with the teaching of hygiene; since 1900 he has lectured only in the latter subject and veterinary legal medicine.

After the reorganization of the Budapest Veterinary Institute into a veterinary academy, he was appointed its director and after its further reorganization into the Budapest Veterinary College he became its president (rector), in which office he remained till 1917 and thereafter was reelected in successive two-year periods until 1931. Having obtained in 1889 the title, "Privat-Dozent," in the Budapest University, he received in 1899 the title of associate professor, and in 1922 the title, honorary professor, of the university of Pecs, and also honorary professor of the veterinary colleges in Vienna and Berlin. He has been chairman of the National Veterinary Association of Austria-Hungary since its formation in 1900. During the period 1906 to 1921 he was president of the Hungarian Association of Veterinary Physicians. As executive vice president, he organized the VIII International Veterinary Congress in Budapest in 1905.

From 1929 to 1932 he was president of the Permanent Commission of the International Veterinary Congresses, retiring because of illness at the meeting of the Commission in Paris in April 1932. He was president of the International Bureau of Epizootics from 1929 to 1932 and was reelected for a term of three years. Since 1926 he has been representative of the veterinary college in the Upper House of the Hungarian Parliament. He was a member of the Hungarian Academy of Science and of St. Stephen Academy. He was an honorary member of many foreign associations and societies including the Royal Society of Medicine, the Royal College of Veterinary Surgeons (England) and the A. V. M. A.

His field of work was infectious diseases, especially tuberculosis, glanders, and hog cholera. His chief literary production was "Special Pathology and Therapeutics of the Diseases of Domestic Animals," written jointly with J. Marek. Since 1904 it has passed through six editions and has been translated, in some instances repeatedly, into the English, Italian, Spanish, and Russian languages. This monumental work is used as a text in all American veterinary colleges, and in veterinary colleges throughout the world.

Steddom Retires and Pistor Becomes Chief of Meat Inspection Service

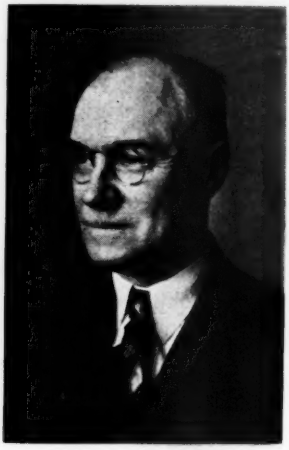
The retirement on Dec. 31, 1934, of Dr. R. P. Steddom, chief of the Meat Inspection Division of the Bureau of Animal Industry,

Dr. R. P. Steddom.

U. S. Department of Agriculture marks the termination of 37 years of active service. During this time Doctor Steddom supervised the upbuilding of a service which now inspects annually more than 75,000,000 food animals before and after slaughter and has won world-wide recognition for its high scientific standards, practical benefits to industry, and protection to public health. The service has consistently kept abreast of commercial developments and in many cases has made distinct contributions to improvements in equipment and methods.

In commending Dr. Steddom at the close of his distinguished career as a public officer, Dr. John R. Mohler, Chief of the Bureau of Animal Industry, paid tribute to his administrative capacity as well as to the evidence of his scientific ability. "Your genius has expressed itself," Dr. Mohler stated, "in the selection and training of capable assistants and associates with the result that the ideals and standards which you have established will be perpetuated for many years to come.

A native of Ohio, Dr. Steddom was graduated from the Ontario Veterinary College in 1886, and engaged in veterinary practice in Iowa and Illinois until 1897 when he was appointed to the Bureau as assistant inspector in Federal meat inspection. In the early years of his service he was stationed in Kansas City, Mo., and traveled throughout the southwestern part of the United States and in Puerto Rico. Later, as chief of the meat inspection service, he has been stationed in Washington, D. C.



Dr. A. J. Pistor.

Dr. A. J. Pistor, assistant to the chief of the Meat Inspection Division succeeds Doctor Steddom. Doctor Pistor entered the Bureau in December, 1898, and was assigned to meat-inspection work at Chicago. At the beginning of the Bureau's pioneer work in sheep-scabies eradication he was detailed to Fremont, Nebr., and later helped to conduct a cooperative campaign in Wyoming. This work was also extended to include cattle scabies in Wyoming.

When the new meat-inspection law was put into effect (1906), Doctor Pistor was again assigned to meat-inspection work at Chicago as traveling inspector. In 1910 he went to Washington, D. C., to assist in revising the meat-inspection regulations and

shortly thereafter was assigned as one of the assistants to the chief of the Meat Inspection Division.

The meat-inspection service employs regularly about 2,500 persons at the 150 stations and substations. In carrying on the work Doctor Pistor plans to continue the same general policy that has been in effect.

"Corn Stalk Disease" Serious

Reports of serious losses of horses and, to a lesser extent of cattle, in several midwestern states have been coming to the U. S. Department of Agriculture since early in November. In most cases, the animals have been pastured on corn stalks or have been fed on corn fodder or on the grain itself. The severity of the situation is indicated by the occurrence of more than a thousand cases of "corn stalk disease" in a single state. Several states are involved. It has been estimated that 60 per cent of the animals die.

For many years, veterinarians and livestock men have observed that—particularly in certain years when the corn crop has been inferior—the turning of stock into the corn fields in the late fall and winter resulted in the occurrence of an acute and highly fatal disease. Immature, stunted, improperly cured, frozen, moldy, or otherwise inferior corn or corn fodder has been believed to be directly responsible for the trouble.

The exact nature of the substance presumably a part of the feed is not known, but it has commonly been considered to be of a poisonous rather than an infectious nature. In some former outbreaks in cattle, the malady has occurred in a form suggesting hemorrhagic septicemia, an infectious disease, and in some of this year's cases the bi-polar organism has been found. The affection as it has occurred in horses is somewhat suggestive of the specific infectious brain disease now known as encephalomyelitis. Investigations are now in progress in an endeavor to determine whether such a factor may be involved.

Nations Must Unite in War on Parasites

Men are still gradually losing ground in the war with parasite pests of domestic animals, Dr. Maurice C. Hall, Chief of the Zoological Division of the U. S. Department of Agriculture, warned veterinarians at the Twelfth International Veterinary Congress in New York City. One trouble, Doctor Hall pointed out, is that men seem to be dealing with the parasite problem not as a war of extermination, as is desirable, but more in the sporting spirit such as regulates shooting on a hunting preserve. Men dispose of surplus parasites but usually leave enough so that by the following year the supply is about normal.

In a few large-scale campaigns results of vigorous warfare on parasitic enemies of livestock indicate that the annual savings will equal or exceed the cost of the whole campaign. The attack on the cattle tick in the southern part of the United States is the most familiar example. In some other instances effective control or eradication has resulted as a by-product of some activity which men undertook for another reason or as a measure of general sanitation, for example, meat inspection or sanitary disposal of sewage. In general, however, man has been losing the war and parasites have been increasing and enlarging their territory both because of increasing concentration of domestic animals and because of improved intercommunication between all parts of the world.

Doctor Hall considers it probable that the growing airplane traffic between North and South America will bring in tropical parasites that will attack our herds, unless quarantine procedures are exceptionally rigid. He said that in some instances man is not acting effectively to control parasite pests because research has not yet discovered how to control them, but in more cases research is far ahead of practice. Pests have been spreading over the world, and in the long run control on a national and even on an international scale will prove the

effective way to combat them. He invited the veterinarians to form either an official or an informal international organization to consider the strategy required in dealing with the parasites.

In dealing with specific treatments for disease conditions caused by worms, Doctor Hall, who developed the use of carbon tetrachloride for hookworm, pointed out that there are two distinct problems, one dealing with the organism which causes the diseased condition. The usual method of attack is to pay attention to the symptoms and treat sufferers, whether animal or human. But there are many cases of infestation which do not manifest symptoms and which are often disregarded. As long as these latter are allowed to persist, there will be constant danger from carriers, and perpetual warfare. The effective attack would be to eradicate parasites whenever possible, even from the individuals and the animals in which there are no visible bad results, thus bringing these wars to a successful conclusion and insuring permanent peace on these battle fronts.

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Testing for Bang's Disease Extensive in Many States

The testing of cattle for Bang's disease is under way in practically all states. In combating this disease the Bureau of Animal Industry is cooperating with state officials. In the four months of July, August, September and October a total of 232,185 cattle were tested, of which 33,368, or about 14 per cent, were reactors and designated for removal and slaughter.

States that made the most progress in the work during the four months are Virginia, Ohio, Minnesota and Wisconsin, in each of which more than 20,000 cattle were tested. The largest waiting list in any state at the end of October was in Minnesota, where 360,000 cattle are listed for testing. In all states there was a total of 891,968 cattle on waiting lists on October 31.

Screw Worm Prevalent in Southeast

In a devastating sweep through the Southeastern States last summer, the screw worm —a fly larva, which bores its way into animals wherever the skin is broken—caused big losses, reported to amount to millions of dollars. Cool fall weather checked it, but it is likely to be active next summer over an even wider territory. Unless some natural agency checks it, stockmen of the Southeast can prevent further heavy losses only by changing their practices, according to Dr. F. C. Bishopp of the U. S. Department of Agriculture

The screw worm, long a pest in the Southwest, did not invade the Southeast until 1933, when it caused considerable damage in southern Georgia and northern Florida. Early last summer it spread over most of these two states, and also invaded southern South Carolina, Alabama, Mississippi, and Louisiana, and ranged westward through southern Texas to the sections where it normally occurs. It appeared for the first time in central Indiana and northwestern Iowa but it will not be able to live through the winter in the North, according to Dr. Bishopp. Probably it can live over winter only in the warmer parts of the country, but it is a good traveler and spreads fast each season.

Doctor Bishopp denies absolutely that the screw worm came into the Southeast with Government cattle shipped from the drought areas. It appeared in Georgia and Florida in 1933, in advance of any drought-relief cattle. Because they were freshly branded and ear-tagged when brought into the screw-worm infested region, however, these animals suffered severely from the pest.

Eradication of the screw worm seems impractical, Dr. Bishopp says. By concerted action, however, it can be kept under control, especially in the farming sections. Control in open range country is more difficult. An effective control method for the Southeast was developed by Department entomologists called into the new field from Texas

where they had been dealing with the same problem. This method calls for prompt treatment of all infested animals with benzol and pine-tar oil and the avoidance of wounds such as those caused by branding, ear-tagging and dehorning, during the screw-worm fly season (May 1 to November 15). Department entomologists headed an extensive campaign to get this method in effect in Mississippi, Florida, and Georgia, and conducted surveys in Alabama, Louisiana, and southeastern Texas. The Emergency Relief Administration agencies in the states provided funds for the fight against the pest and for the protection of drought-relief cattle. Although there were thousands of cases of screw-worm infestation after this work was begun, the death rate, especially among full-grown animals, was greatly reduced.

Screw-worm flies—bluish-green blowflies with three dark stripes along the back and with yellowish-red faces—lay yellowish eggs in irregular masses on the edges of wounds or blood spots. Within 10 to 12 hours the eggs hatch into screw-shaped larvae, or maggots, which promptly penetrate the wound, causing bleeding and pain. The maggots rapidly destroy the tissues and enlarge the wound, thus attracting more flies. Finally the vital organs are exposed or the poisons from the extensive wounds are absorbed and the animal dies. The presence of screw worms in a wound is usually indicated by a discharge. The infested animal often looks sick and tries to scratch or lick the wound. Badly infested animals, especially sheep, leave the herd and hide away in the brush.

The screw worm will attack any animal, either domestic or wild. Instances of its attack on man, followed sometimes by death, have been reported. There is no great danger of such fatalities, however, if care is taken not to sleep during the day in places to which flies have ready access.

Losses last summer in the Southeast were particularly heavy among sheep and hogs, although cattle, mules, and horses suffered too. Even wild animals, such as deer, fall prey to the pest. New-born animals are especially attractive to the flies. Whole litters of pigs were killed in a few days. Stock branded or ear-marked during the fly season is almost sure to be infested. A slight scratch or wound, or even a crushed tick, may bring on trouble. A large tick native to the Gulf Coast States commonly attaches itself in the ears of animals. The cracks and scabs caused by these ticks attract screw-worm flies.

The control system found effective by Department of Agriculture entomologists involves: (1) frequent examination of all livestock for wounds or screw worm cases; (2) immediate treatment of screw worm cases with benzol, to destroy the worms, and with pine-tar oil, to keep the flies away; (3) avoidance, as far as possible of wounds during the fly season which calls for the delay of branding, marking and dehorning until after killing frosts; (4) control of stock breeding so that all young will be born from November 15 to May 1; (5) prompt burning of all carcasses; (6) calling in a competent veterinarian for valuable animals that are badly infested.

Dr. H. B. Raffensperger Dr. F. C. Bishop
These men have been on special screw worm investigations for the past two years.

The use of strong medication to kill screw worms is dangerous and "single treatment" remedies are ineffective, if not actually injurious. Benzol and pine-tar oil, which are inexpensive and generally available, have proved most effective under all conditions.

The Etiology of Fowl Paralysis Leucosis and Allied Conditions*

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FOWL paralysis (neurolymphomatosis gallinarum-Pappenheimer) first observed by Marek in 1907, and leukemia, first studied by Craigie and Bennett in 1845, have long been regarded as separate and distinct disease entities. Although these diseases have been the subject of much investigation, particularly in recent years, no generally accepted theories have been advanced concerning their etiology.

In the case of fowl paralysis, intestinal parasites and a filterable virus have been the most commonly advanced etiological agents. Micro-organisms have never been claimed as a cause of this disease. The literature contains very little scientific data on the cause of leukemia until 1908, when Ellermann was able to transmit the various types of this disease to healthy birds by means of the injection of tissue emulsions and filtrates prepared from affected organs. Ellermann's observations have since been confirmed by a score of investigators all of whose work has concerned this filterable agent. Very few investigators, however, have ventured to call this filterable agent a filterable virus. In recent years investigators working on the etiology of fowl paralysis have found that this disease also may be transmitted to healthy birds by means of tissue emulsions and filtrates prepared from affected organs. For this reason most of these workers have declared a filterable virus to be the cause of fowl paralysis. Some investigators have advanced circumstantial evidence to show that this filterable virus may be transmitted through the egg to the baby chick.

All of these workers, however, have failed to show that this filterable virus has all of the properties commonly attributed to a filterable virus. Likewise they have failed to give convincing experimental data as to the mode of infection in natural occurring outbreaks of this disease.

Although the work of Patterson has been criticized by many workers he must be given credit for being the first to conclude that fowl paralysis and leucosis, as it is now called, are a manifestation of a single etiological agent. Johnson recently confirmed this observation. Patterson, however, believed a filterable virus to be the cause while Johnson termed the etiological factor a "filterable agent."

OUR investigations extending over a period of four years confirm the conclusion of these two investigators, that fowl paralysis and leucosis are a manifestation of a single etiological agent but differ in that, repeatedly and consistently, we have been able to induce these diseases by means of micro-organisms—certain members of the paratyphoid and typhoid groups of bacteria. We have not only been able to induce fowl paralysis and the various types of leucosis with these organisms as the primary etiological agents but we have also been able to induce certain allied conditions associated with naturally occurring outbreaks of these diseases.

Organisms of the paratyphoid and typhoid groups of bacteria may be isolated from the intestinal tract of many birds affected with enteritis, principally associated with intestinal parasitism, and occasionally from the intestinal tract of young birds affected with the first symptoms of fowl paralysis.

IN A SERIES of experiments it was determined that enteritis in most instances is a necessary predisposing factor in that it

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furnishes an avenue of infection for the primary etiological agent. Parasite-free birds, fed broth cultures of the causative organisms for periods of 10 and 90 days, remained under observation for 150 days following the last exposure to infection and failed to develop either fowl paralysis or leucosis. Birds artificially and naturally exposed to intestinal parasites and given an opportunity for chronic enteritis to develop were similarly exposed to the causative organisms with the result that they consistently developed fowl paralysis, leucosis, or an allied condition, in 75 to 80 percent of the cases. Likewise parasite-free birds exposed to the causative organisms by intravenous injection develop a similar pathological condition although in many instances such cases are atypical. This may be attributed to the fact that chronic intestinal parasitism in many cases weakens the resistance of the bird or that other factors are involved which renders the bird more susceptible.

THE great variance in the pathological condition that may be manifested is such that many investigators have been most skeptical about believing that all of these conditions could be caused by a single etiological agent. However, the pathological condition which develops depends on many factors: (1) the severity and duration of the enteritis, (2) the age and resistance of the bird, (3) the inherent properties of the primary etiological agent and (4) the duration of the infection and the rate at which the causative organisms enter the blood stream. One can recognize readily that various combinations of these factors might easily induce a wide variation in the pathological manifestation although the fundamental pathological process in each instance is similar. All pathological manifestations artificially induced with the etiological agent are comparable to similar pathological manifestations occurring in natural outbreaks of these diseases in the field.

THE causative organism establishing itself in the intestinal tract gains entrance to the blood stream of the bird through an inflamed intestinal mucosa. Once in the blood stream the natural defenses of the bird are called into action in an effort to destroy the invading micro-organisms. This action gives rise to hemocytoblastosis, the predominating cell types depending upon the rate of entrance and number of organisms entering as well as the potency of the endotoxin contained within the causative organism. Endotoxin which is an important constituent of the groups of organisms acting as the primary etiological agent now becomes an important factor in the continuation of the process. Phagocytes destroy the invading bacteria, the endotoxin elaborated on the destruction of the bacterial cell in turn destroys the phagocyte. Endotoxin further inhibits agglutination which results in delaying the phagocytic process which may result in an increased number of phagocytes being called into action. If the organisms are too numerous to be destroyed by the phagocytes the erythrocytes are attacked resulting in a marked numerical decrease of these cells. *In vitro* 0.01cc. of endotoxin, 1cc of which is capable of killing a 20-gram mouse in 16 hours, retards agglutination in the highest agglutination titers of a positive serum in a standard tube agglutination test. Repeated injections of endotoxin of such potency that 1cc would kill a 20-gram mouse in five minutes have failed to induce cases of fowl paralysis and leucosis. It is of more than passing interest, however, to note that the intravenous or intraperitoneal injection of such endotoxin into young chicks often causes typical but transient symptoms of paralysis.

Only in exceptional cases during the entrance of the causative organisms into the blood stream can the organism be isolated from the tissues of the bird.

Hemocytoblastosis once initiated, and we might say that we have never failed to initiate this process in any of our experimental birds by even extraordinary routes of infection, the process continues during the period of infection which roughly estimated may be as short as five days or as long as 15 to 20 days. The causative organism then completely disappears from the picture. All attempts to isolate it from the intestinal tract fail.

Hemocytoblastosis, however, continues, the impetus now being due to an apparently new substance formed in the blood stream during the initial stages of this process. This new substance is apparently a product of the disintegrating blood cells. It is not known at this time whether endotoxin becomes a component part of this substance. That this new substance is toxic to blood cells cannot be questioned as the destruction of blood cells continues with the bird attempting to compensate for this destruction by the formation of new blood cells. The hypothesis is advanced that this new substance is of such chemical structure that the normal physiological processes of the body find it difficult to eliminate. Whether the bird eventually shows symptoms of paralysis, leucosis, or an allied condition depends upon the manner in which the process of hemocytoblastosis continues under the stimulus of this newly-formed substance. By reason that some birds recover from hemocytoblastosis of the most severe type one seems justified in believing it possible that some birds may possess the ability to eliminate it from the body. The cell types now found in the process of hemocytoblastosis depends much upon the original impetus given by the micro-organism and the "toxicity" of the newly-formed substance.

WE BELIEVE it is this toxic substance, which apparently is accumulative, that is responsible for the fact that fowl paralysis and leucosis are transmissible to healthy birds by means of tissue emulsions and filtrates of affected organs and which many investigators have regarded as a filterable virus. The fact that when leucosis is transmitted by the use of tissue emulsions in a series of birds the incubation period becomes shorter upon each transmission in those birds which develop the disease tends to support the theory that it is accumulative. Also by the fact that cases of leucosis induced quickly by the intravenous injection of the causative organism cannot be transmitted by means of tissue emulsions. However, cases of leucosis induced by these organisms by proper injection methods or by their natural avenue of infection are transmissible by means of tissue emulsions and filtrates of affected organs.

The course that hemocytoblastosis takes seems to depend much upon the resistance of the bird. While the resultant pathological condition is dependent in a large measure upon the original impetus given hemocytoblastosis, the resistance of the bird and perhaps tissue vulnerability are important.

The period of incubation is represented by this process of hemocytoblastosis and in cases in which the organisms gain their natural avenue of infection may be from 20 to 150 days. The incubation period is shorter in young than in old birds. Cases of lameness, incoordinated gait, paralysis of one or both legs, paralysis of the wings, partial and complete loss of equilibrium, a spastic condition affecting the cervical muscles, blindness in one or both eyes, erythroleucosis, myeloid leucosis, "going light," and sarcomatosis have been induced.

In an outbreak of fowl paralysis as mentioned previously many birds that develope hemocytoblastosis recover, never having shown symptoms of infection. Very few birds which develop symptoms recover.

SALMONELLA AERTRYCKE has been found to be the most common causative organism causing natural outbreaks of fowl paralysis and leucosis. To date we have been able to induce cases of these diseases with *Salmonella schotmulleri, Salmonella enteritidis, Salmonella suipestifer* and *Salmonella typhimurium.*

THE importance of the discovery of the cause of fowl paralysis and leucosis in chickens is many fold: first, it offers a working basis for the control of one of the most important disease problems confronting poultrymen in every country in the world; second, increased emphasis is placed on the control of intestinal parasites; third, it opens an entirely new field for the epidemiologist interested in human health as many of the organisms concerned are capable of inducing disease in the human being; and fourth, we believe that this research offers a stepping stone for the determination of the cause of leukemia in other animals as well as in the human being.

Drugs Used in Veterinary Medicine

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II. Digitalis—The Great Heart Tonic

History.—Digitalis has, for a long time past, been the watchword of many laymen. It is found illustrated in the beautiful herbals of the middle sixteenth century; but its history dates back to a much earlier period. The plant was very popular amongst the people of Wales who used it externally as a domestic remedy, in cases of scrofula, although for internal purposes they referred to it as a "violent medicine." It received some emphasis in the middle of the seventeenth century when it was employed for reducing fever, but its place in medicine was not well established until the latter part of the next century (1785) when Withering completed his investigation of its properties. In his "Account of the Foxglove" the English physician of Birmingham tells how he learned of an old woman in Shropshire who had brewed a tea made of many herbs, which gained wide reputation in the treatment of dropsy. He later found that a fellow physician had cured a case of "hydrops pectoris" by means of a preparation of the foxglove root, after the most well-known physician of that time had given up hope. In his own words: "I was determined to pursue my former ideas more vigorously than before but was too well aware of the uncertainty which must attend on the exhibition of the root . . . and therefore continued to use the leaves." It is thus evident, how it might be possible for a "white witch" to pass down to modern man a most useful remedy.

Source.—The digitalis plant, *Digitalis purpurea,* is a biennial herb ranging from two to five feet in height. It is found in many parts of England and is widely distributed in Europe, being cultivated in Germany. In the United States, particularly in the western portion, it is grown for its ornamental value almost as much as for the drug market. All parts of the plant contain active medicinal substances but these are especially concentrated in both the seeds and the leaves. At one time the seeds were as much employed as the leaves, but today in most countries the leaves are the official source for the drug. For a long time the official standards in this country limited collection to the second year growth, but this restriction was removed in 1910 since it was found that the quality varies according to the maturity, the curing and the storing of the leaves. They are now collected from plants which have just reached the flowering stage. Not more than two per cent of browned leaves are allowed by our official standards. When they are fresh there is a marked unpleasant odor which is not distinctive after drying. They have a strongly bitter taste. Drying is done at a low temperature, after which the leaves are stored in air-tight containers until ready for shipment. In this condition they occur as a mixture of crumpled leaves and broken pieces because of their papery character. They are then packed into bales.

The plant obtains its common name, Foxglove, from the fancied resemblance of its speckled purple flowers (which are arranged along a row on the stout stem) to an ancient instrument called the "Foxes-Glew" which consisted of an arched arrangement of small bells. It obtains its other name "digitalis" from its similarity (of the flower) to the finger of a glove or a thimble, for which reason the Germans call it "fingerhut" and the French "gantelée."

Assay.—Digitalis is one of the few drugs of the Pharmacopeia for which standardization by means of a "biological assay" is required. This method of testing is employed when the active constituents of a drug cannot be determined chemically, or when a chemical assay does not represent

a true measure of the drug's activity. There are a large number of methods used in testing the potency of this drug by means of various animals, but the one that has been adopted in the U.S.P.X. is the so-called "one-hour frog method." This consists of injecting a properly diluted tincture of the drug into the ventral lymph sac of the frog

The leaves of *Digitalis purpurea*. The whole leaf averages from 10 to 30cm in length and from 11 to 15cm in breadth. It is somewhat oval in shape, and has a slightly wavy border. The upper surface is slightly roughened, and dull-green in color, whereas the lower surface is much paler, having a prominent network of light-colored veins and a dense coat of fine hairs. The leaves which come from the lower portion of the plant have an extension of the blade.

and noting the reaction on the heart. The volume, of course, has been carefully recorded. If a sufficiently large dose or overdose has been given, when autopsy is made, the heart will show the single ventricle contracted in systole and both auricles with an exaggerated diastole, the heart exhibiting no movement whatever. If the drug is below the standard, that is, if it is too weak it will be found that the heart still beats at a normal or decreased rate. By using a large number of frogs and injecting doses of increasing or decreasing quantity depending on what the observations indicate, it is possible to find the amount required to "produce in one hour a stoppage of the ventricle of the heart in systole." This is known as the "minimum systolic dose"; for digitalis the standard set is .006cc of the tincture for each gram of body weight of the frog.

The present official frog method has proved very unpopular amongst cardiologists and drug manufacturers. It is considered inaccurate by some since sensitivity of these animals is so variable, but the chief arguments against its continuance are based on the theory that the amphibian heart reactions are not comparable to the mammalian effects. Guinea-pig and cat methods have been devised which serve as excellent units and a recent plea for uniformity by a group of well-known cardiologists seeks the adoption of the Hatcher-Brody cat method which yields uniform and reliable results which are also comparable. Thus when a sample is found to be stronger than another preparation by this method, it is found to be active in the same proportion upon the human heart. The method consists essentially of the following steps. The digitalis leaf to be assayed is made into a tincture by the official method after which it is diluted (x 20) by physiologic saline solution. This diluted tincture is injected slowly into the saphenous vein of the cat until the heart stops (from ventricular fibrillations). By using a number of normal cats, and measuring the volume necessary to cause death, under the conditions described, the "minimum lethal dose" per kilogram of cat can be determined; and from this the amount of leaf contained in this "unit" of the tincture can be estimated readily. This method in which the action is determined by effects on the mammal is by far the most accurate of those so far devised.

Preparations.—The official preparations of digitalis include the Powder, the Fluidextract, the Tincture (10% strong), and the Infusion (1½%). There are two compound pills which contain digitalis, one with powdered squill and mass of mercury, and the other with quinine and opium.

The active constituents of digitalis are glucosides which are chemically unstable and therefore difficult to isolate in their pure form. Those which have been definitely separated, thus far, are three in number: digitoxin, digitalin, and digitonin. There is much confusion in the use of the latter terms, including some duplication, due to

proprietary and other preparations of the extractives; but in general these represent modifications in the extraction of the above principles or a mixture of these, and in a few instances the extract obtained from the seeds in place of the leaves.

Digitoxin is the chief active constituent of the leaf consisting of a crystalline alcohol-soluble compound having the formula $C_{34}H_{54}O_{11}$. It is the most toxic constituent also, being very irritant locally and persistent in action.

Digitalin is an amorphous alcohol-soluble compound having the formula $C_{35}H_{56}O_{14}$. It is obtained from the seeds and is about one-half as active as digitoxin. Its action is not as persistent as digitoxin, but it is more actively emetic. It should not be confused with "French" digitalin, "German" digitalin or crude digitalein, each of which represent mixtures obtained from the leaves or seeds by various methods. True digitalin is a pure glucoside, and is also known as Kiliani's or Schmiedeberg's digitalin.

Digitonin is a saponin having the formula $C_{55}H_{90}O_{29}$ and is water-soluble and occurs both in the crystalline and amorphous forms. It is obtained mostly from the seeds, the leaves having only a trace. This constituent, like all saponins, is irritant and hemolytic but does not have the cardiac action characteristic of the other two compounds. By some it is thought to facilitate the absorption of the active glucosides from the alimentary canal.

It is thus seen that the tincture or other alcoholic preparations contain both digitoxin and digitalin, whereas the powdered drug contains all three constituents. Recent works refer to the digitalin herein mentioned as "Gitalin"; and a third crystalline glucoside, called "Gitoxin," has just been reported.

Another possible addition to our digitalis group in materia medica is the species *Digitalis lanata,* which is indigenous to Hungary. From first reports it appears that this leaf is more active than the official purple species, and besides containing "gitoxin" it also contains a glucoside of its own called digoxin ($C_{41}H_{64}O_{14}$) which is crystalline, soluble in alcohol and sparingly so in water. It is said to be stable both in solution and the solid state, and when administered, it gives uniform and reliable effects and therefore (reports state) need not be biologically standardized. Furthermore, it may be given orally or intravenously and the digitalis effect follows very promptly. Perhaps the day is not far off when digitalization can be brought about with definitely isolated and stable compounds which need not be tested at the expense of animals previous to use.

There are other drugs which belong to the digitalis group chief amongst which are strophanthus, squill and apocynum, the last mentioned being the source of "Cymarin." All of these must be assayed biologically and do not appear to have distinct advantages over the leader of the group, digitalis.

Action.—The action of digitalis varies according to the species of the animal and even in the same species there is marked difference possible according to the cardiac condition that exists. For example in cattle large doses administered orally will prove markedly less effective than when the same proportional dose is administered to dogs and horses, since it appears that several of the glucosides are destroyed in the digestive tract in cattle before absorption occurs. Intravenous injections appear to have similar effects on all animals, however.

Digitalis does not affect the unabraded skin, but mucous membranes are readily irritated. When preparations are injected, there is so great a reaction that inflammation and often abscesses are produced. The animal dislikes the bitter and unpleasant taste, and regardless of the mode of administration of the drug it may cause nausea and vomiting. This last-mentioned action is more likely due to reflex effects from the heart or comes from a central origin, an effect which is characteristic of these heart tonics.

Formerly the gastro-intestinal disturbances were thought to come from the local reaction, but this has been disproved recently. In the intestine it often produces profuse diarrhea. The active constituents of the drug are absorbed slowly into the blood stream, taking even as long as sev-

eral days for digitalization to develop. When injected intramuscularly, the effects begin in about 8 to 12 hours, and intravenously the results are obtained within a few minutes. Since digitalis is absorbed slowly and still more slowly eliminated, the effects are considerably prolonged. Its main action is centered in the heart, but the general circulation and the kidneys are involved also. The speed with which it acts often depends upon the efficiency of the circulation of the animal under treatment. Thus, with a poor circulation the absorption is slow and the effects develop very gradually.

Digitalis has a multiple action on the heart. It makes the heart beat slower and stronger by the stimulation it causes in the vagus center. It therefore increases the strength of the contraction of both the auricles and ventricles, prolonging the period of rest (diastole) during which the heart fills up with more blood. Since there is a stronger contraction (systole) a larger quantity of blood leaves the heart and accelerates the flow in the blood vessels. The tonus of the cardiac muscle itself is also improved, and in larger dosage there is an increase in irritability which results in premature contraction of the ventricles. It is thus evident that the therapeutic dose must be so regulated that this increased irritability will not exceed the inhibitory action on conduction. In moderate concentrations, the peripheral arterioles are constricted, though this phenomenon varies with the organ affected, since sometimes there is dilation. The end effect of such a change in heart activity consists of a more rhythmic contraction, a greater period of rest during diastole, an artificial heart block due to lessening of the conduction of impulses along the muscle fibers of the heart, and improvement of the local cardiac circulation because of the greater contraction followed by the longer rest interval.

The flow of urine is affected particularly in cases where the tissues are edematous. This is due to the improved circulation both in the kidney and in the general circulation.

There is a very important phase of digitalis action which must not be overlooked. In a recent report, Christian explains how the drug after absorption fixes itself in the myocardium. This explains its prolonged activity. There is a latent period between its administration and its effects, and this occurs no matter what mode of administration is followed. After the first effects there is a further "break" before the climax of activity is reached. This indicates that the effect of a dose cannot be judged until a certain interval has elapsed, and in case an overdose be given there is no way at present by which this excess can be removed from the heart muscle. Thus it is important to note that a sufficiently large dose must be employed, but an excessive dose must be avoided absolutely, since there is no substance known that can remove the "fixed" principles.

Therapeutics.—Digitalis is indicated in veterinary practice when there is a functional derangement of the heart, when the heart becomes weak and irregular and when circulation is threatened. It has wide application in valvular conditions such as mitral and aortic stenosis, in pericarditis and endocarditis, and in diminished compensation of an enfeebled heart. In the latter case it has special application since the digitalized heart will pump more blood into the arteries, thus preventing engorgement of the heart and veins, and reducing the chances for dropsical complications. It is particularly useful as a tonic after debilitating diseases, shock or poisoning by such cardiac depressants as Veratrum (hellebore), Delphinium (larkspur) and Aconite (monkshood) especially if it is reinforced with other general stimulants such as strychnine.

Digitalis has been widely used in certain respiratory ailments such as chronic bronchitis, emphysema and pneumonia where it reduces the possibility of venous congestion by its action on the right ventricle. It is also efficient in improving the circulation in case of distemper in dogs and influenza in horses. Besides, the drug is invaluable in treating dropsical conditions due to failure of circulation. This is accomplished by increasing systemic circulation as well as that within the kidneys. For this purpose it is often prescribed in conjunction with squill,

potassium acetate, ammonium acetate or juniper to increase diuresis.

Digitalis is contra-indicated in case of aortic insufficiency or acute myocarditis without insufficiency. It is very useful in palpitation due to overworking an animal, but is not recommended in palpitation of nervous origin or from digestive disturbances. It is not recommended to relieve renal or hepatic dropsy or effusion such as occurs in cases of peritonitis, pleurisy, etc.

DOSE TABLE

Drug or Preparation	Animal	Apothecary	Metric
Powder or Fluid extract	H	gr. x-1x	.6-4.
	C	ʒ ss-iss	2-6.
	S	gr. v-xv	.3-1
	D	gr. ss-iii	.03-.2
Extract	H	gr. v-x	.3-.6
	C	gr. v-xv	.3-1
	S	gr. i-ii	.06-.13
	D	gr. 1/8-½	.008-.03
Infusion	H	℥ ii-vi	60-180
	C	℥ iii-viii	90-240
	S	℥ ss-i	15-30
	D	ʒi-iv	4-15
Tincture	H	ʒiii-vi	12-24
	C	ʒiii-viii	12-30
	S	ʒi-iiss	4-10
	D	m x-xlv	.6-3
"Principles": "German" Digitalin (mixture from seeds)	H	gr. ¼-½	.016-.03
	C	gr. ¼-½	.016-.03
	S	gr. 1/30-1/10	.002-.006
	D	gr. 1/60-1/30	.001-.002
"French" Digitalin & Digitoxin	H	gr. ⅛-¼	.008-.016
	C	gr. ⅛-¼	.008-.016
	S	gr. 1/40-1/20	.0015-.003
	D	gr. 1/100-1/60	.0006-.001

Digitan or Digipuratum
an extract freed from digitonin. 1cc. of the liquid is equivalent to 1½ gr. of U. S. P. leaves. The tablets are each equivalent to 1½ gr. leaf.
Digitol is a fat-free tincture used as the official tincture.
Digifolin is a soluble preparation of digitoxin.
Digalen is a sterile solution of digitoxin for hypodermic use. It contains 1/225 gr. of digitoxin for every 1cc.
The tablets represent ½ the strength of the liquid.
Digipoten is a mixture similar to digitan.
Digoxin is the pure glucoside isolated from Digitalis lanata. The dosage has not as yet been completely determined for all animals.
Digifortis is a fat-free tincture having an activity 50% greater than the U. S. P. tincture.
Digitalone is a purified extract of the official leaves.

Toxicology.—As has already been implied, poisoning from digitalis is quite frequent due to sensitivity shown by certain animals and especially because of its cumulative action. Horses are more susceptible than dogs, and cattle are the least affected (with oral dosage). Since the drug is slowly absorbed and also slowly eliminated, even in therapeutic doses, it can be seen readily how over-dosing may come about. Most of these cases arise from too rapid digitalization with an extra pushing of the drug before the first delayed symptoms appear. It should therefore never be used in full doses without awaiting the first "digitalization" signs which should not be followed by another dose until the first effects begin to "wear off." Otherwise the initial slowing effects will be followed by an acceleration of the heart beat which often is the death knell. If a rapid, feeble and irregular beat ensues the drug should be discontinued immediately.

The symptoms of poisoning include loss of appetite, nausea, vomiting (in the dog and cat), diarrhea, irregular and rapid pulse, cold extremities, and salivation. In extreme cases there is colic, bloody stools, scanty urine and the eyes may protrude. Death occurs anywhere from a few hours to several days. After a single toxic dose, death may be delayed for a day or so. It should here be carefully noted that digitalis should never be administered to an animal that has been under treatment by any other drug or principle that belongs to this group until it is determined that such drug is completely eliminated.

The treatment of digitalis poisoning consists in discontinuing the drug, keeping the victim as quiet as possible, subcutaneous administration of atropine sulphate (which counteracts the over-stimulation of the vagus), hot applications to the extremities and cold compresses to the heart region.

Poisoning of animals from eating the leaves and stems of *Digitalis purpurea* sometimes occurs. Owing to its wide use as an ornamental plant animals naturally have frequent access to it and sometimes, notwithstanding its bitter acrid taste, eat quantities of it sufficient to cause poisoning. The symptoms of such poisoning and the treatment are the same as in poisoning from over-dosage.

There is no doubt that, in the hands of the careful practitioner, digitalis is one of our most wonderful heart tonics. Used with caution as it should be, and watching for its first effects before further dosing, should serve to insure against untoward symptoms. It should then have a rightful place among our "specifics."

Liability of Veterinarian for Incompetent Services

By LEO T. PARKER,
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MOST veterinarians realize the possibility of financial loss from litigations, yet the improbability of losses from this source is such that many fail to protect themselves against occurrences of disastrous legal controversies.

Obviously, attorney fees, costs of carrying a litigation through several courts and a final verdict in favor of the complaining party may easily entail the expenditure of a large amount of money. Moreover, the records of law suits show that veterinarians are involved in a relatively large number of legal controversies, the result being that each month new law suits are decided involving important points of the law.

One of the most practical methods by which veterinarians may avoid financial losses, resulting from legal controversies, is to become familiar with the cause and outcome of litigations involving other veterinarians. Chances of suits are lessened, and at the same time legal information, records of cases, etc., are accumulated which may be relied upon to win suits.

Therefore, the purpose of this article is to impart desirable and valuable legal information, based upon leading higher court cases, involving suits against veterinarians for negligence or lack of ordinary care in treating animals.

What Is Malpractice?

Various courts have held that malpractice may involve an error of judgment or of diagnosis on the part of the veterinarian, or may arise where surgeons have rendered a proper diagnosis but have failed, not purposely but unintentionally, to use ordinary care to render reasonably efficient services.

It is important to know that the higher courts have held consistently, that although a veterinary surgeon may leave an instrument in the body of an animal, or remove the wrong organ, or fail to operate when an operation is the only solution, such act is in itself *not* sufficient to render the surgeon liable in damages. In other words, in addition to proving any of these facts, the owner of the animal must show that the veterinarian failed to exercise ordinary care. Therefore, in almost all suits of this nature the legal meaning of the term "ordinary care" is very important.

Must Use Ordinary Care

Just what this term means depends upon the particular circumstances surrounding the case. There is no certain rule applicable in deciding all cases, because the testimony, conditions and circumstances of each litigation must be weighed and considered carefully before a dependable opinion can be rendered.

However, it has been held that the term "ordinary care" is that degree of care which would have been exercised by a veterinarian having average prudence under the identical circumstances. For this reason the courts have held that "ordinary care" of a veterinarian means the carefulness required to perform a particular operation or treat a particular disease, which is consistent with the circumstances and in consideration of the risk to be apprehended and guarded against.

Another important rule of the law is that a veterinarian who accepts a case may expressly state, and if not he implies, that he has the skill to treat the animal in a manner likely to effect similar beneficial results as may be accomplished by another veterinarian of average skill and prudence who exercises his best judgment. No excuses are acceptable by the courts to vary this rule.

There are two methods of immunizing swine to hog cholera. The single treatment method which confers only a passive immunity for usually a short period of time involves the use of anti-hog-cholera serum

only, and the simultaneous method of immunization which confers an active humanity of probably lifelong duration. This is taught in veterinary colleges. Also, it is taught that injection of serum is a correct method of prevention to employ in a herd of cholera infected hogs. Notwithstanding the fact that a veterinarian may not have been taught these things, yet he is liable for failure to use ordinary care in preventing loss. So held a higher court in the recent case of Bekkemo v. Erickson, 242 N. W. 617.

The facts of this case are that a farmer owned 47 spring pigs weighing from 210 to 225 pounds, 10 sows weighing 450 pounds and 50 fall pigs weighing about 40 to 50 pounds. On October 29th one spring pig had died and another was sick. On that night five fall pigs died; ten other fall pigs were sick. The ailment was cholera. A veterinarian was called professionally on October 30th. He cut open four or five of the dead hogs. He did not diagnose the ailment as hog cholera. He said the pigs had "necro."

On November 4th another veterinarian was called and diagnosed the sickness as hog cholera. The next day he administered hog cholera serum. There were then but 27 hogs living. All these died except two sows and two spring pigs.

The farmer sued the veterinarian first called for the value of the pigs and hogs which died, contending that the veterinarian was negligent for failure to properly and correctly diagnose the disease as hog cholera and immediately administer hog cholera serum. The farmer obtained favorable testimony from three veterinarians.

The counsel for the veterinarian argued that since the latter is not a graduate veterinarian he does not follow the practice taught in colleges. Also, the veterinarian testified he does not give the usual preventive treatment for hog cholera and does not treat hog cholera.

It is interesting to observe that in the face of this argument the higher court held the farmer entitled to recover the value of the hogs which *might have been saved* by prompt administration of serum. This court said:

"Defendant (veterinarian) told plaintiff (farmer) his hogs did not have hog cholera. He did not find the presence of hog cholera. . . . There is but one school of veterinary medicine. The fact that defendant (veterinarian) was not a graduate of any veterinary school does not put him in a different school from other members of the profession of veterinary medicine who have graduated from a veterinary college. . . . The gist of this action is the failure properly to diagnose the sickness. . . . He (veterinarian) did not open the throat or lung cavity of any of them, he did not take out or examine the bladder, kidneys, spleen, or the liver. . . . There is expert testimony in the case that, if hog cholera serum had been administered on October 30th all the sows would have been saved; that 85 to 90 per cent of the spring pigs would have been saved; and that 50 per cent of the fall pigs would have been saved."

Therefore, it is quite apparent that any person, whether or not he be a graduate of a veterinary college, who holds himself out as a competent veterinarian, and is employed as such, may be liable for negligence or malpractice in the treatment of animals, if he fails to exercise ordinary care in administering proper treatment.

Negligence Not Implied

In determining whether the proper skill and care are employed in the treatment of a diseased animal, the usual knowledge possessed by other veterinarians and the manner of treating the disease by methods commonly practiced is important. If the method of treatment is recognized as being reasonably likely to effect desirable results by experienced veterinarians who are graduated from recognized colleges, a veterinarian is not deemed negligent if he follows the course in attending to the case which he believes is suitable under the particular circumstances, even if there are other reliable recognized methods of treatment.

However, there are circumstances under which it is not necessary for the owner of an animal to prove that a veterinarian was negligent in attending to his duties. For instance, if a veterinarian attempts to per-

form services, particularly an operation, while he is grossly under the influence of intoxicating liquor, or drugs, he may be held to have been mentally and physically unfit to attend to his duties. Under such circumstances, negligence on his part may be presumed with the result he is liable.

Negligence on the part of a veterinarian makes him liable for the resultant damages. A veterinarian may be deemed negligent, for example, if he fails to examine carefully an animal which is under treatment. Usually, if it can be proved that a veterinarian was negligent while making an examination, or failed to make an examination, and legal proceedings are instituted against him for damages as a result of injury or death of the particular animal, he is liable if it can be shown to the satisfaction of the court that his negligence was the direct cause of the injury.

On the other hand, if the owner of the animal directs the veterinarian in the method of treatment which he desires the veterinarian to follow the latter is not liable in damages for the injurious consequences. But the courts hold that where an owner employs a veterinarian to treat an animal and merely suggests a kind of treatment, it is the duty of the veterinarian to use his own good judgment and exercise diligence to adopt the proper method of treatment likely to produce beneficial results.

In fact, a higher court in a recent litigation said that unless a veterinarian receives an *absolute order* from his employer specifying what services he desires to be rendered, with respect to the animal being treated, the veterinarian is in duty bound to direct what should be done to prevent injurious results and, also, to give his personal attention to such matters so far as they fall within the ordinary scope of a veterinary surgeon's profession. Proof to the satisfaction of the court that a veterinarian fails in these respects ordinarily will result in a decision that he is guilty of negligence which, of course, renders him liable.

Where a Veterinarian Donates Services

In cases where a veterinarian renders gratuitous services as an accommodation, or as a friendly act, or without receiving pay, making a charge or hope of payment his liability is less than when rendering service for pay or in the expectation of payment. In such cases he is liable only for gross negligence.

If an animal owner requests the services of a veterinarian, even though the services are performed for mere accommodation, the veterinarian is required to use at least slight care to adopt the proper treatment.

For illustration, in a leading case it was shown that a very valuable animal had a swelling on a joint. The veterinarian who attended the animal decided that he could cure it by lancing. The treatment rendered the animal practically valueless. The owner sued the veterinarian to recover damages.

During the trial evidence was introduced proving that the veterinarian had performed the operation in an unskillful manner, and that he performed the services without compensation.

It is important to know that the higher court explained that a veterinarian is not liable even though an animal dies in consequence of an operation performed without usual skill, because the rule of the law in cases of this kind is that a veterinarian is bound only to exercise a *slight degree* of diligence and care, and he is responsible *only* where it can be proved that he was *grossly* negligent.

On the other hand, the law is well established that a veterinary surgeon, who undertakes and agrees to treat an injured or sick animal without pay, is liable in damages to the same amount, as when he is hired to render the professional services, if he is grossly negligent or positively without ability to render beneficial services.

For instance, in a leading case it was disclosed that an incompetent veterinarian acted without pay and advised an immediate operation on a diseased animal. The animal died as a result of the operation and the owner filed suit.

The court held the veterinarian liable and explained that if a veterinarian assumes to perform a delicate operation, and he is grossly unskilled, or grossly negligent, he is liable for the losses sustained by the owner of the animal.

Antidotes for Hydrocyanic Acid Poisoning

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CANE poisoning in cattle is occurring more frequently than in the past due to the wider production and use of sudan and related canes for feed. For this reason and because a recent report by Stanton[1] in which sodium hyposulphite was used as a remedy with gratifying results, it seems that a discussion of the toxicology of hydrocyanic or prussic acid should be of general interest.

The poisonous substance responsible for cane poisoning is a non-glucosidal form of prussic acid arising from the hydrolysis of the original glucoside, dhurrin. Dhurrin (parahydroxymandelonitrile) occurs in especially large quantities in millet, sudan grass and the sorghums. It is hydrolysed by the enzyme, emulsin, which is present in plant tissue, into hydrocyanic acid, oxybenzaldehyde and glucose. The cyanide is absorbed and carried by the blood stream to all the body tissues where it inhibits the action of the oxygen-activating enzyme, indophenol oxidase. As a result of this phenomenon, the tissues are unable to utilize the oxygen in their normal metabolic processes, and there is an accumulation of oxyhemoglobin on the venous side of the circulation. This results in causing the venous blood to be the same color as the arterial blood, a fact which can be used in diagnosing cyanide poisoning. However, after death has occurred the blood usually is dark in color.

THE symptoms of poisoning are, therefore, those of an internal asphyxiation of tissues in the presence of an excess of oxygen. At first, in most cases the central nervous system is stimulated, later depressed. The stage of stimulation is very short and is associated with excitement and convulsions. Subsequently depression, which involves all parts of the central nervous system, occurs. The respirations become deeper and quicker in the beginning and later irregular, weak and finally cease. The inspiratory phase of respiration is shortened, the expiratory phase correspondingly prolonged. The pulse is at first rapid, but soon becomes weak and imperceptible. The pupils are dilated and nonsensitive to light; the eyes are glassy, staring and very prominent as in cases of asphyxia due to other causes. Usually the mouth and often the nostrils are filled with foam, and there may be involuntary evacuation of urine and feces.

The minimum lethal dose of HCN by the mouth for cattle and sheep, according to Clawson, Bunyea and Couch[2] is in the neighborhood of 2.315 milligrams per kilogram of body weight. They also determined the minimum toxic dose for these animals.

VARIOUS preventive measures and antidotes for hydrocyanic poisoning have been suggested and used with varied degrees of success. The simplest preventive measure and one which has given fairly good results is the feeding of a carbohydrate concentrate before permitting animals to eat sorghum or sudan grass which may be poisonous. This practice is based upon the fact that an enzyme is only compatible with and therefore only enters into combination with that sugar, the simplest glucosidic compounds of which it is able to hydrolyse[3]. Dhurrin contains one molecule of glucose and consequently is accompanied by an enzyme which can combine with this simple

sugar. By feeding a starch-containing concentrate, a sufficient amount of glucose is provided to combine with the enzyme, thereby inactivating it. This prevents the hydrolysis of the glucoside and the subsequent toxic effects of the cyanide. The phenomenon is of interest in stock poisoning because an animal can ingest and detoxify a considerable amount of cyanide before the toxic symptoms appear. Loevenhart, Malone and Martin[4] studying the effect of sodium cyanide on respiration in dogs found that the intravenous injection of .25 milligrams per minute into an 8-kilo dog over a considerable period of time produced no effect. They concluded that this was the maximum rate of detoxification of the substance in the body. Turner and Hulpien[5] found that rabbits were able to detoxify a little less than 2mg of sodium cyanide per kilo of body weight per hour, which is in close agreement with the above results when expressed on the same basis. This natural ability to detoxify cyanide may be sufficient to take care of the free hydrocyanic acid present in the forage if further hydrolysis is prevented.

Glucose is of doubtful value as an antidote after poisoning has occurred. Results on experimental animals to determine the effectiveness of glucose are rather contradictory. Bougault and Perrier[6], Violle[7] and others conclude that sugars, especially glucose, are antagonistic to cyanides. However, other investigators, Hynd[8], Heymans and Soenen[9], Turner and Hulpien[5], were not able to demonstrate a protective action of glucose against cyanide poisoning.

Methylene blue has been used with some success as an antidote for cyanide poisoning, even though the method by which it acts is not entirely understood. Some investigators believe its effectiveness is due to its ability to change oxyhemoglobin to methemoglobin, the methemoglobin in turn forming a stable compound with cyanide, which is excreted as such. Brooks[10] and others postulate the theory that methylene blue, representing a reversible system, i. e., the ability of being reversibly oxidized and reduced without changing its character, may act as a substitute for the oxidase which is rendered inactive by the cyanide. Experimental work indicates that methylene blue administered intravenously in the form of a 1 per cent aqueous solution does not afford as much protection as the antidotes which are discussed later. Intravenous injections of quantities of methylene blue in excess of 2.5cc of a 1 per cent solution per kilo of body weight were injurious to test rabbits[11]. Clawson and his co-workers[2] found that 50cc of a 1 per cent methylene blue solution protected sheep against 1.42 times the minimum lethal dose.

Sodium nitrite has also been suggested and used in cyanide poisoning with some degree of success. Its action is due to its ability to change oxyhemoglobin to methemoglobin, which in turn forms a stable compound with the cyanide. However, it also has its limitations when larger doses of cyanide are present, because only a certain amount of the oxyhemoglobin can be changed to methemoglobin without endangering the life of the animal by decreasing the oxygen-carrying capacity of the blood to the danger point. Clawson, Bunyea and Couch[2] found that sodium nitrite would protect sheep against 1.42 times the minimum lethal dose (2.3 milligrams HCN per kilo of body weight) and cattle against a single minimum lethal dose (2 milligrams HCN per kilo of body weight).

Sodium thiosulphate, also known as *sodium hyposulphite* ($Na_2S_2O_3 + 5H_2O$), *sodium tetrathionate* ($Na_2S_4O_6$), *colloidal sulphur,* and any *sulphur compound* which is capable of liberating sulphur in the body and is not too toxic in itself, are definitely protective against cyanides. The preparations mentioned above, when administered intravenously in relatively large doses, i. e., 3 or 4 grams per kilo of body weight in rabbits, are apparently harmless. Their action depends on their ability to furnish sulphur, which combines

with the cyanide to form thiocyanates. The latter are relatively non-toxic and are readily excreted in the urine. From the report by Stanton[1] on the use of sodium hyposulphite, it would seem that considerably smaller doses than mentioned above would be enough to produce the desired effect in cattle. The rapidity of action in his cases was remarkable in view of the fact that both sodium thiosulphate and tetrathionate produce their effect slowly, because free sulphur is liberated from them most rapidly in an acid medium, while the change of cyanide into thiocyanate occurs best in a weakly alkaline solution.

Dihydroxyacetone was found by Forst[12] to be the most effective of the simple reducing sugars for immediately relieving the symptoms of cyanide poisoning. However, the symptoms reappear in the same severity as originally in approximately fifteen minutes. It is suggested that its brevity of action as an antidote is probably due to the fact that it is rapidly oxidized and the cyanide again set free. If, however, a sulphur compound such as sodium hyposulphite ($Na_2S_2O_3 + 5H_2O$), which can liberate free sulphur, is present, the cyanide combines with the sulphur as fast as it is set free and forms thiocyanate, which is nonpoisonous and is excreted rapidly. This work was subsequently confirmed by Turner and Hulpien[5]. Dihydroxyacetone at the rate of 1.2 grams per kilo of body weight gave excellent results when administered intravenously in experimental rabbits, in conjunction with $Na_2S_2O_3 + 5H_2O$. Under practical conditions the combination of these two antidotes may not be suitable for veterinary use due to the fact that dihydroxyacetone is difficult to procure and is relatively unstable. Moreover, it would appear from Stanton's experience with cattle that sodium hyposulphite is quite satisfactory of itself.

A MORE striking antidotal effect was demonstrated by Chen, Rose and Clowes[13] who supplemented sodium thiosulphate with sodium nitrite. They found that the combination of the nitrite and thiosulphate does not only show synergistic action, but also surpasses the sum of their individual values. The combination was 6½ times as effective as methylene blue and protected animals against 13 times the minimum lethal dose. They administered 22.5 milligrams of sodium nitrite and 2 grams of sodium thiosulphate per kilo of body weight. Under practical conditions this dose could be administered in divided amounts until complete recovery is effected. Sodium nitrite and sodium thiosulphate in combination have been used with good results in cattle. They protected against two minimum lethal doses of cyanide.

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[5]Turner and Hulpien. *J. Pharm. and Exp. Therap.*, 1933, 48:445.
[6]Bougault and Perrier. *J. de Pharm. et Chem.*, 1920, 22:129.
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[8]Hynd. *Biochem. J.*, 1927, 21:1094.
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[10]Brooks. Proc. Soc. Exp. Biol. and Med., 1934, 31:1134.
[11]Draize. *Science*, 1933, 78:131.
[12]Forst. *Arch. f. Exper. Path. u. Pharmakol.*, 1928, 128:1.
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No One Escapes

Every man, woman and child in America has been affected by the decrease in horses and mules. Because of this decrease, manufacturers and merchants have seen their sales decline; wage earners, whether paid by the hour, day, week or month, have had their wages reduced, or have lost employment; persons living on income producing property, whether stocks, bonds, real estate or other property, have suffered diminution of income, and farmers have received lower prices for their products.—Wayne Dinsmore.

Abstracts

Blood Constituents in Colts

The bloodsugar level of colts[15] varies between 119-127 (extreme range 98-145) mg. per 100cc of blood. The nonprotein nitrogen content of the serum varies from 37.6mg per cent of the new born colt to 22.5mg per cent in older nursing colts. In weaned colts, one-year old colts and two-year old colts the values are 29.4, 28.6 and 29.6mg per cent respectively. The alkali reserve in colts of all ages varies little; in nursing colts it is 59.8mg per cent, in weaned colts 60.2mg per cent, in one-year old colts 59.3mg per cent, and in two-year old colts, 58.4mg per cent.

Phlebitis of the Spermatic Veins and Posterior Vena Cava

The observation[16] concerns a fatal case of phlebitis followed by septico-pyemia supervening the castration of a horse by crushing. Besides the usual lesions of general septicemia, there was found a voluminous abscess in the muscles of the thigh, another one in the pectoral muscles and several in the lungs. Behind the left kidney was an elongated conical mass the size of one's arm extending to the internal inguinal ring. The sublumbar lymphatic glands, ureters and spermatic arteries were surrounded by a fibrous mass. The spermatic veins were not in evidence, being represented by a fibrous cord adherent to the mass. The posterior vena cava contained a thrombus 15 centimeters (6 inches) long extending from the spermatic vein forward.

The Loss From Poultry Diseases in Canada

A special committtee of experts convened by the Minister of Agriculture of Canada to report[17] on losses sustained in the Dominion of Canada from poultry diseases stated that 30 per cent of baby chicks purchased each year by the farmers die within the first three weeks after purchase; 25 per cent succumbing to various infections, and five per cent falling victims to predatory animals and other agencies. It requires the procurement of 80,000,000 day-old chicks annually to maintain a poultry population of 50,000,000. The annual losses computed from the figures collected is estimated at $6,000,000.

Molasses Forage for Horses

In former times sugar was regarded as a condiment, but not as a feed for farm animals. As in human beings also it was thought to be harmful. Decayed teeth, indigestion, and diabetes were the dire consequences attributed to the eating of saccharated diet. This erroneous conception was, however, not entertained in warm climates where the nutritive value of cane sugar for man and animals has been known since time immemorial. The Arabs in the sixteenth century allowed their horses over four pounds of sugar daily. In Asia, a mixture of sugar, alum and opium is customarily given to camels before starting on long voyages. Pressed dates containing 60% of sugar are fed to horses, asses, camels and the personnel of caravans in South Algeria. Cane molasses is regularly fed to horses in South America especially to prepare them for hard work, and mixed with ground corn and roughage it constitutes nine-tenths of the feed of mules in Louisiana. "Sugar mules," as they are called, bring from 25 to 30 per cent more on the market than "cotton mules" because they are more hardy and more vigorous. Strangely, in the face of these facts, farmers still refuse to feed sugars when it is both convenient and profitable to do so.

As the overproduction of sugar and the sugar beet crisis, however, has led to exagerations which would make sugar alimentation a universal panacea, it seems necessary to establish the truth with impartiality. *Beat sugar molasses* contains, water, 22.4%; proteins, 0.5%; starch, 8.5%; sugar, 46 to 52%; minerals, 8 to 12%, of which 90% is

[15]Luy, P. and A. Köser, 1934. Ueber den Gehalt des Blutes Trakehner Fohlen verschichener Alterstufen an Blutzucker, Rest-Stickstoff and Alkalireserve, (Blood-sugar, nonprotein nitrogen and alkali reserve of the blood of colts). *Arch Tierheilk*, 67:4, pp. 347-357.

[16]Lassebre, Rev. *Vét. et Jour. de Med. Vét.*, December, 1933, p. 668.

[17]*La Revue des Eleveurs*, Quebec.

potassium and sodium; and non-crystalizable polysaccharids, 7 to 8%. *Cane molasses* contains scarcely 2.5% of minerals and 60 to 70% of sugar. Obviously, the large quantity of the latter required in a ration is due to its lack of mineral elements. The two essentials of a molasses are its sugar and mineral content. It is in no event a balanced ration. Its advantage as a carbohydrate is that it loses less of its nutritive value than starch in the process of fermentation, and absorbtion is more rapid and complete; so rapid in fact that it has a distinct "kick." It is utilized quickly by the organism—twenty minutes after ingestion. No other feed equals sugar in this respect. The sugars are not reserve aliments. They are used up as fast as they are consumed, and thus furnish an immediate source of muscular energy. Following the ingestion of a ration of sugar, the pulsations and blood pressure augment and vaso-dilation and circulation become more active. The point is to determine the amount of feed with other forages.

Sugars augment the desire for food and therefore increase the intake and being an almost entirely pre-digested ingredient of the whole, it does not impose much additional burden upon the process of digestion. However, the effect on the digestibility of the ration varies with the conformation of the digestive apparatus of horses, ruminants and swine. In the horse, the stomach being relatively small, the sugars are disposed of before the aliment reaches the large reservoirs. That is, whether the ration contains sugar or not, the digestive process for the remainder of the ration is unchanged, yet a strict differentiation must be made between sugar and ordinary molasses, as horses eat less food mixed with molasses than with pure sugar.

In ruminants, the aliment sojourns a long while in the stomachs. This is advantageous so far as feeds rich in cellulose are concerned but quite different with such easily digested ingredients as sugar and molasses. The process of fermentation attacks the sugars and permits the cellulose to pass out of the body undigested. In large doses, therefore, molasses diminishes digestibility in ruminants. This is particularly true when the molasses content is high.

The author [19] attempts to determine the sugar tolerance of horses fed with "caramelized molasses," that is, molasses in which the potassium salts are neutralized by heat to the extent that it becomes slightly acid instead of alkaline. The tests show that molasses thus treated can be fed in larger percentages than ordinary molasses.

* * * *

Foot and Mouth Disease and Cow Pox

Delbé [18] cites previous work done in attempting to establish a certain relationship between variola and foot and mouth disease of cattle; mentioning the work of Ory (1901), of Starcoviou and Calinesco (1908), of Berlin (1923), and of de Blieck and Johnson (1931). These investigators attempted to prove that an attack of pox confers immunity against any future exposure to foot and mouth disease virus. Delbé's attention was first attracted to the alleged relationship in 1921 by the owner of a herd badly affected with foot and mouth disease in which the owner pointed out that the only cow that was not affected was one presenting lesions of variola. In this outbreak the mortality was 30%, yet not virulent enough to infect the variola case.

In 1933, the author had occasion to make a series of five observations on as many different farms where animals affected with pox lesions solidly resisted the contagion. The report gives complete details of the five observations, each of which appears to be convincing proof of the contention.

* * * *

Blood Transfusion in the Dog

In researches [20] on blood groups in dogs no agglutination was ever observed from mixing the blood cells of a dog with the serum of other dogs, in 226 tests by the method of Verge and 20 tests following that of Michon.

[18] Delbé, M., Fièvre Aphtheuse et Varole. *Rec. de Méd. Vét. de l'École d'Alfort*, 90:9, pp. 280-283.
[19] Lahaye, J. Essais d'alimentation du cheval aux fourages mélasses. *Ann. de Méd. Vét.*, 79:7, pp. 289-306.
[20] Adams, P. Thèse pour le Doctorat Vétérinaire, abs. *Rev. de Path. Comp.*, 33:444, September, 1933.

The anticoagulant action of sodium citrate is not complete except when the dose is five to six grams per litre of the dog's blood. The author cites incidents of citrate shock and intolerance of dogs receiving variable doses of sodium citrate intravenously.

He recommends that blood be taken from the jugular vein of the donor to the amount of about 18% of the total blood volume. The reinjection of the blood after being citrated is done slowly (25 to 30cc per minute) and in amounts of 6 to 7cc of blood per kilo of body weight.

Of eight dogs affected with distemper treated by transfusion, a tonic action was noted and the resistance of the patient increased. The conclusion was that blood transfusion is a long, delicate and costly procedure.

Mad Itch

In studying the receptivity of swine to bulbarparalysis, mad itch, or Aujeszky's disease two specimens of the virus were employed,[24] one from Brazil and one from Hungary. By feeding brain and visceral tissue of animals dead from the disease the experimental subjects died of the American type of the affection. The pigs died in three days after showing nervous and digestive symptoms. The virus collected from swine and passed through rabbits retained its virulence for swine but positive results under similar conditions were less constant with the Hungarian than with the Brazilian virus.

In Holland, therapeutic sera have been incriminated as a propagator of the disease, so the authors undertook a series of experiments which showed that the virus was present not in the plasma but in the organized constituents of the blood and thus cast considerable doubt on the alleged danger. The rat, they believe, may be a propagator of mad itch and swine may contract the disease by way of the digestive tract.

The same authors draw attention [25] to the differential diagnosis of mad itch and rabies both having certain symptoms in common (excitement, salivation, pica, paralysis). The onset of rabies is slow, of mad itch, rapid. As a general rule there is no pruritus[26] in rabies while in mad itch that symptom is violent. The paralysis of rabies is prolonged, of mad itch it is short, occurring at the time of approaching death. Rabies lasts three to five days, mad itch 24 to 48 hours. To these clinical symptoms must be added the laboratory differentiations, that is, the finding of Negri bodies in rabies. The authors also point out that cats will contract the disease (mad itch) when fed cerebral substance of animals dead from that disease.

New Classification for Organisms

The *Actinobacillus lignieresi* Brumpt and the *Shigella equuli* (van Straaten 1918) Edwards exhibit morphological and biological similarities and are serologically related.[28] Attention is called to the misspelled form "equirulis" for "equuli" in the fourth edition of Bergey's Manual of Determinative Bacteriology. The *Actinobacillus lignieresi* is also serologically related to the *Actinobacillus mallei*. It is proposed to combine these three bacterial species together with the *Actinobacillus pseudomallei* into the genus Actinobacillus. Thirgenus is to be subclassed under the family Bacteriaceae with a position between the genera Hemophilus and Pasteurella.

Clinical Significance of Vaginal Secretions

Saprophytic germs in the vaginal mucosa of bitches are capable of developing pathogenic characteristics when they happen to be introduced into the uterus.[29] The examination of the vaginal secretion in conjunction with the clinical findings is of practical diagnostic value.

[24] Remlinger and Bailly. La Maladie d'Augeszky et le Pore. *Rev. de Path. et de Hyg.*, 34:451, April, 1934, p. 504, abs. *Bul. de l'Acad. Vét.*, April, 1933, p. 169.

[25] *Ibid. Bul. de l'Acad. Vét. de France*, March, 1933, p. 115.

[26] Granouillit. *Rev. Vét. et Jour. de Méd. Vét.*, March, 1933, p. 142, reports a case of rabies in a dog, showing violent pruritus of the fore legs, vomiting and pharyngeal paralysis.

[28] Haupt, H., 1934. Zur Frage der Verwandschaft des Actinobacillus Lignieresii Brumpt 1910, des Bacillus equuli van Straaten 1918 und des Bacillus mallei Flügge 1886 (Relationships Between Actinobacillus Lignieresi, Actinobacillus mallei and Shigella equuli). *Arch. Tierheilk*, 67:6, pp. 513-524.

[29] Demmel, M. and J. Witzigmann, 1934. Die klinioche Beurteilung des mikroskopischen Untersuchungs befundes des Vaginalsekretes bei der Hündin (Clinical Evaluation of Vaginal Secretions in Dogs). *Arch Tierheilk*, 67:6, pp. 489-502.

Synovial Exudates and Brucelliasis

While it is by no means established that Brucella organisms are primarily etiologic in hygromas and hydroarthroses, it is nevertheless true that the presence of *Br. mellitensis* and *Br. abortus* can be detected frequently in the fluid contents of such affections. The presence of *Br. mellitensis* was found in the synovial fluid of an hydroarthrosis of the knee of a man five months after the onset of an attack of Malta fever.[21] The specimen was taken during one of the afebrile periods of the attack.

In an examination of 203 cows affected with hygroma of the knee,[22] 79 gave positive reactions to the sero-agglutination test, while 1,055 cows not so affected gave only 12 reactions. The presence of the organisms was demonstrated in 11 cases examined. The authors conclude that while Brucella organisms are not the primary cause of hygroma of the knee in cows, these lesions are reservoirs of considerable importance.

* * * *

Campaigns Against Ox Warbles

In recent years[23] attempts have been made to reduce the damage inflicted by hypoderma which is of considerable importance. The best method of treatment, although the least practical, is extraction of the parasites by hand. In France, in the majority of cases attempt at local chemical treatment led to use of cyclic hydrocarbons and especially an ointment of paradichlorobenzene, 1 to 5. In Germany a powder of *Derris elliptica* is employed. It has been noted that young animal lose their receptivity in growing older and this led to attempts at artificial immunization, believing that the first attack conferred immunity. The tests, however, were negative.

The indifference of breeders to the affection has caused certain countries, notably Denmark, to make warble treatment obligatory. In France, there is no legal obligation placed on the owners. Only the leather syndicate carries out an intense campaign in which the departmental veterinarians and practitioners participate.

* * * *

Vaccine Not a Specific

The Friedmann vaccine is not a specific remedy[30] either against tuberculosis or against actinomycosis. It does not protect against inhalation tuberculosis, and it has no curative effect upon an already existing tuberculosis infection.

* * * *

Bulbar Paralysis (Pseudo-Rabies) in Swine

Aujeszky's disease (paralysis bulbaris infectiosa—H. & M.), is an acute infectious disease, caused by a filterable virus,[31] characterized by paralysis of the medulla oblongata and, in a majority of cases, by an acute febrile process without cerebral symptoms. Swine of all ages are highly susceptible to infection. In larger herds the morbidity is 40 to 60% and often may reach 100%. Swine are, however, more resistant to the effects of the virus than are dogs and cats; the mortality in the former rarely exceeding 2 to 5% in spite of the epizootic proportions of infection. Cattle, horses and sheep are also susceptible. The disease is distributed over the entire earth. It has been diagnosed in Hungary, France, Germany, Holland, Denmark, Switzerland Croatia, Siberia, North America and Brazil. Aujeszky's disease, doubtlessly, occurs also elsewhere, but it is not always correctly diagnosed.

The virus occurs in various sections of the brain, in the blood, in the spleen, in other blood-containing organs and in the urine. Brain and spleen contain the virus in concentrated form, while relatively small quantities occur in the urine. It is assumed that the common portal of entrance is the digestive tract. The virus is also easily inoculated through skin-lesions; even minute quantities are sufficient to cause infection. The dissemination of the virus takes place

[21]Antonini and Coulon. *Bul. de la Soc. de Path. Exotique*, vol. xxvi, 1933, p. 566, abs. *Rev. de Path. Comp. et de Hyg.*, 34:451, April, 1934.
[22]Magnusson. abs. *Rev. Gén. de Méd. Vét.*, Aug. 1933; *Rev. de Path. Comp. et de Hyg.*, 34:451, April, 1934.
[23]Abs. *Rec. de Méd. Vét.*, 90:6, June, 1934.

[30]Bongert, J., 1934. Ist das Friedmannsche Mittel ein spezefisches Tuberkulose-Heil-und Schutzmittel und von überragender Wirkung gegenüber anderen Heilmethoden? (Investigations Concerning the Friedmann Tubercu[illegible] Vaccine). *Arch. Tierheilk*, 67:6, pp. 459-488.
[31]Köves. J. and G. Hirt, 1934. Ueber die Aujeszky's et le Krankheit der Schweine (Pseudo-Rabies in Hogs). *Arch. Tierheilk* 68:1, p. 23.

mostly through saliva, bronchial secretion and urine.

The incubation period in swine as in other animals is generally three to five days. The clinical symptoms in pigs are high fever (up to 41°C.), anorexia, vomitus, diarrhea, restlessness and cerebral symptoms. In 10% of the cases there are muscular twitchings, convulsions and manege movements. The paralysis of the throat is often accompanied by ptyalism and foaming, due to the involuntary movements of the jaw.

The lesions observed on autopsy are a primary pulmonary edema, reddening of the larynx, dilation of the vessels of the intestinal wall, and various symptoms of circumscribed blood stasis. Frequent lesions are laryngotracheitis, enteritis (instead of blood stasis), but such are secondary lesions. Histo-pathological changes are found in the brain tissue. Recovery from the disease conveys immunity. A fatal infection may be combatted by a specially prepared serum. Among swine and sheep the disease takes on such an acute character and is spread so rapidly, that one may correctly assume that the disease must be epizootic. It occurs in horses and cattle. It is not unlikely that the enzootic encephalo-myelitis is a form of Aujeszky's disease. It is probably that this disease in a somewhat milder form occurs also in dogs and cats, but as a rule, it does not exhibit distinct manifestations. If the disease is noted, then as a rule, it is interpreted as an anorexia and droopiness caused by factors other than pseudo-rabies. The disease has not been observed in man.

* * * *

Viability of Larvae of Strongyles

Packing of the manure will generate sufficient heat to destroy strongylide-larvae.[33] Disinfection of the manure is uneconomical. Alkalysol in 1% solution is recommended for the scrubbing of the stable floors. For the spraying of the walls, carbolineum is to be preferred over lime spray. Artificial fertilizers will not destroy any larvae in the pasture. Best results are obtained with 1% copper sulfate solution, preferably during a dry spell. Collection of the feces every second or third day is also suggested.

* * * *

Lesions of Equine Infectious Curemia

In more than 80% of cases of swamp fever,[32] the lesions were macroscopically visible and affected the endocardium in 54.8%, the heartfat in 50%, the myocardium in 48.4%, the diameter of the heart in 41.5%, the vessels in 31.5%, the heart valves in 11.5%, the epicardium in 8.4%. The lesions were essentially hardened productive processes of a uniform character.

* * * *

Fluorine Poisoning in Iceland?

For many years, usually following volcanic eruptions, a peculiar disease[34] was observed in Iceland. It occurred more severely among sheep than among the other animal species. The characteristic symptoms were loss of milk, progressive emaciation and thickening of the bones. There occurred also a malformation of the teeth. Subsequent experiments upon sheep made it plausible that the disease in question was the result of fluor-poisoning. Fluor has been found to be present in volcanic ashes of other countries, but no definite analysis has been made as to its presence in Icelandic volcanos.

* * * *

Excretion of Brucella Abortus

In addition to the presence of bacillus Bang in the udder,[35] the bacteria were found also in the mammary lymphnodes, in the uterine mucosa and its secretion, and in the right kidney. The liver, spleen and gallbladder did not seem to contain the Bang bacillus. The finding of virulent abortion bacteria in the nongravid uterus disproves the statement that the *Brucella abortus* does not flourish in the nonpregnant uterus. All

[33]Enigk, K., 1934, Die Widerstandsfähigkeit der Entwickelungsstadien der Strongyliden ausserhalb der wirtstiere, (Resistance of Strongylide Larvae Outside of the Body). *Arch. Tierheilk*, 67:5, pp. 363-376.

[32]Bolle, W., 1934, Makroskopische Herzbefunde bei Einhufern mit infektioser Anämie, (Macroscopical Heart Lesions in Solipeds, Harboring Swamp Fever). *Arch. Tierheilk*, 68:1, p. 42-49.

[34]Roholm, K., 1934. Fluorose der Schafe auf Island nach Vulkanausbrüchen? (Is Fluorosis of Icelandic Sheep the Result of Volcanic Eruptions?) *Arch. Tierheilk*, 67:5, pp. 420-35.

[35]Lübke, A., 1934. Untersuchungen an einer latent infizierten, mit der Milch Bangbakterien ausscheidender Kuh (Excretion of Bacillus Bang from the Bovine Udder). *Arch. Tierheilk.*, 67:5, pp. 436-452.

the organs showing Bang infection, exhibited also histological lesions. The latter consisted of necrobiotic changes in the lymphglands, abscess formation of the uterine glands and interstitial inflammation and roundcell infiltration in the kidneys.

* * * *

A Report on the International Veterinary Congress

Among the reports printed in foreign publications not essentially of the veterinary profession was one appearing in *Revue de Pathologie Comparée,* of Paris. The report reads:

The Congress was a success from all points of view. The attendance was important and the membership twice as numerous as that of preceding congresses.

The distractions offered to the delegates were varied. The weather was fine and all contributed to an agreeable sojourn for the Congressists.

Among the remarkable excursions were a visit to the Walker-Gordon Farm at Plainsboro, New Jersey, and to the division of research on animal diseases of the Rockefeller Foundation at Princeton. Another visit made by a large majority of the foreign delegates was at the veterinary college of Cornell University at Ithaca, New York.

The clinical demonstrations which followed the Congress also attracted the majority of the foreign delegates, of whom prominent figures participated in the surgical and diagnostic technique.

Two trips were organized for the foreign delegates for the week following the Congress. The group traveled to Chicago by way of Niagara Falls and to Detroit where a visit was made to the Ford automobile plant. Three days were spent in Chicago, visiting the stock yards, export houses and the World's Fair. Ninety-seven took advantage of this trip.

At Chicago the party divided, one returning by way of Toronto, Montreal and Quebec, and the other by way of Washington where different sections of the government were visited, but especially the Department of Agriculture.

Among the pleasant events of the sojourn in Chicago was the magnificent banquet on August 22, given to the veterinarians and their families by the Institute of American Meat Packers. Short addresses were made by Professor R. von Ostertag (Germany), Professor George Woodbridge (England), Professor Carlo Bisanti (Italy), Professor Jean Verge (France), Professor P. Rubay (Belgium), and Mr. Charles E. Herrick, president of the Institute. Among the guests were the Counsels of England, Germany, France, Belgium, Italy, and Spain on duty in Chicago.

A review of the literature already published on the Twelfth International Veterinary Congress in this and foreign countries, in scientific publications outside of the veterinary circle, comes as a new breath of life to our veterinary service. Others have discovered us and we have discovered ourselves, through this short but never to be forgotten event, which occurred in the 59th year of veterinary education in the United States, 151st year in England, and in the 173rd year in Continental Europe. The significance of these figures is showing that in the matter of time we were 82 years behind England and 114 years behind France in founding a veterinary profession.

Putting it another way, an evolutionary period of 173 years elapsed before the veterinary profession of the world was mobilized in the United States. Without the improvements in our veterinary educational system now in force the visit might have been delayed much longer.

* * * *

Bacteriological and Serum Institute

Among the various European biological firms manufacturing serum and vaccines for use against epizootic diseases of domestic animals, perhaps none commands a more enviable reputation, both for the dependability of its preparations, and for the exactness of the scientific research carried on by the members of its staff, than the "Bakteriologisches und Serum-Institut Dr. Schreiber," Landsbery, a. W., Germany. The institution was founded in 1898 for the purpose of exploiting Dr. Lorenz' patent on the manufacture of swine erysipelas serum and vaccine. Since that time the manufacture of other vaccines and sera have been added, especially for use against other swine diseases, against fowl diseases and against diseases of the new-born, until at the present altogether about 40 different sera and vaccines are prepared. The institute is also equipped with diagnostic laboratories, a library, postmortem room, crematory, stables, housing 300 horses, mules and cattle, and a large experimental farm; it possesses its own literary outlet the "Mitteilungen," a yearly publication, containing the research papers of its staff members. In addition to

the director, the institute employs three veterinarians, nine technicians, 15 clerks, eight mechanics and 70 laborers. The "Bakteriologisches und Serum-Institut Dr. Schreiber," which is nearing its 37th anniversary, is the life-work of Doctor Schreiber, well known to many American veterinarians from his recent visit to the 12th International Veterinary Congress.

Relations of Hypophysis, Hypothalamus and Autonomic Nervous System to Carbohydrate Metabolism

Davis says that hyperglycemia and glycosuria are not produced by pancreatectomy in cats that have a lesion of the hypophysis. Bilateral hypothalamic lesions, symmetrically placed, may be followed by pancreatectomy without the development of hyperglycemia and glycosuria. Such lesions must be situated in the tuber cinereum slightly rostrodorsolateral to the mamillary bodies at the level of the ventromedial hypothalamic nucleus. Stimulation of the superior cervical sympathetic ganglion and the stellate ganglion in cats produce a marked hyperglycemia and glycosuria. These results are not obtained following section of the splanchnic nerves or bilateral symmetrical lesions of the hypothalamus. There are many clinical examples of the relationship between the various lobes of the hypophysis and a neural mechanism in the hypothalamus. Besides the question of carbohydrate metabolism there is the occurrence of diabetes insipidus, adiposity, thermal regulation, pathologic sleep and states of hypoglycemia. To the influence on carbohydrate metabolism of this rather well defined neurohypophyseal mechanism is added the relationship of the autonomic nervous system and the thoracic and abdominal viscera. The author has no evidence as yet that would lead to any information regarding the source of the carbohydrates mobilized in his experiments. The work of Griffith led him to believe that hyperglycemia may develop from stimulation experiments without involving the pancreas, thyroid, parathyroid or hypophysis, provided the suprarenals are intact. As a corollary, Houssay, Biasotti and Rietti have reported that the diabetogenic action of anterior lobe extract may be observed in the absence of the pancreas, hypophysis, thyroid, ovaries, testicles, splanchnic nerves, lumbar sympathetic chains, suprarenals or a lesion of the tuber cinereum. They concluded, however, that the liver alone was necessary. Certain it is that there is evidence enough to throw some doubt on the idea that the isles of the pancreas have an independent secretory control over carbohydrate metabolism. It is well established that typical lesions exclusively characteristic of diabetes have not been found in the pancreas. In fact, Allen has observed changes in the pancreas described as characteristic of diabetes in almost 50 per cent of cases in which there was no diabetes. It would indeed be strange if nature had concentrated the control of such a vital function in one organ. It is more logical to believe that sugar disposal is more carefully safeguarded by perhaps multiple mechanisms.—*Jour. Amer. Med. Ass'n.* 103:24, Dec. 15, 1934.

Histamine in Inflammation

Morgan shows that histamine, when acting on the minute vessels of the skin of dog and man, causes capillary dilatation and engorgement with a slowing of the blood stream and an exudation of fluid. Injury and destruction of tissue, irrespective of the etiologic factor, will allow the liberation of small quantities of the amine, resulting in this reaction. The part played by histamine in the process of inflammation is confined to its effect on the small vessels. Histamine does not call forth the cellular elements in the inflammatory exudate.—*Jour. Amer. Med. Ass'n,* 103:24, Dec. 15, 1934.

Successful Treatment for Piroplasmosis

According to observations of the authors,[86] Todorit, a preparation of Doctor Vaida, Budapest, Hungary, has given promising results in the treatment of piroplasmoses. Recovery took place within three days.

[86] Yakimoff and Swirsky. 1934. Behandlung der Rinderbabesiellose mit Todoris. (Texas fever treatment with todoris). *Tierärztl. Rundschau* 40(33):580.

Book Reviews

Veterinary Helminthology and Entomology. The Diseases of Domesticated Animals Caused by Helminth and Arthropod Parasites, by H. O. Mönnig, B.A., Dr. Phil., B.V.Sc., Professor of Parasitology, Faculty of Veterinary Science, University of Pretoria; Veterinary Research Officer, Onderstepoort, South Africa. 402 pages, 264 illustrations; published by William Wood & Company, Baltimore, 1934. $9.00.

It is rather remarkable that since the publication of Neumann's "Parasites and Parasitic Diseases of Domestic Animals" more than 40 years ago, no work dealing in detail with helminth and arthropod diseases of domestic animals has appeared, although the period that has elapsed since the publication of Neumann's classic has been more productive in the development of veterinary parasitology than all the preceding period.

Mönnig's text probably does not contain sufficient detail for the specialist in parasitology, but it is rendered the more valuable thereby for the veterinarian, in that it gives all that the latter requires and it is not buried in a mass of detail with which he is not concerned.

The increasing realization of the importance of parasitic diseases and the increasing prevalence and ever extending distribution of animal parasites will give this text a welcome at the hands of veterinary practitioners, whose needs it will serve in an acceptable manner.

It is not a complete parasitology, since the protozoa are not included, but the discussion of the parasitic worms, the flukes, tapeworms, round worms, threadworms and leaches includes all species of these parasites of economic importance and the same applies to the discussion of the anthropod parasites.

The practitioner who has not been able to keep up with the rapid development in parasitology during the past two or three decades, and who but parasitologists have been able to keep up with it, will find the general discussion in Section I particularly interesting, informative, useful and welcome. To quote:

A study of the morphological characteristics of parasites, which the student may consider to be an unnecessary extension of his difficult task, is nevertheless an exceedingly important part of the subject, since it is indispensable for the diagnosis of every parasitic disease. Parasites which look much alike may differ greatly in their pathogenicity and habits and require quite different measures for their control. Alternatively, very similar symptoms may be produced by parasites of very different nature, so that the symptoms frequently do not give an indication as to the nature of the parasite and the preventive measures that have to be instituted. The diagnosis of a parasitic disease has always to be confirmed by the identification of the parasite itself or its eggs or larvae obtained from the diseased host. . . .

In temperate climates the importance of parasitic diseases is frequently underestimated. An important fact that needs to be more generally stressed is that the effects of parasitic diseases are often not as striking as those of infectious diseases, which frequently appear in the form of epizootics. It is the slowly gnawing danger of the parasite that is not realized, and the susceptibility to other diseases which it produces. . . .

It should be borne in mind that a few parasites usually do not affect the health of the host, and in almost all instances there is a certain "threshold value" or number of parasites that can be harbored without ill effects.

Parasites may do harm to their hosts in the following ways:

1. By absorbing food intended for the host.
2. By sucking blood or lymph.
3. By feeding on the tissues of the host.
4. By causing mechanical obstruction or pressure.
5. By causing the growth of nodules and tumors and by perforating vessels.
6. By causing wounds through which infection may enter.
7. By destruction of tissues.
8. By irritation.
9. By secreting toxins or otherwise harmful substances.
10. By transmitting the causal agents of infectious diseases. . . . .

Parasitic life does not stand apart from other forms of existence since parasites have originated from free-living organisms, and many intermediate forms occur. Certain species of flies which used to breed in carcasses, later adopted the habits of laying their maggots or eggs in wounds. Such maggots would be termed parasites, while another batch laid by the same fly in a carcass would not fall into this category. Similarly the difference between parasites and herbivorous or carnivorous animals is one of degree only. The herbivore or carnivore is usually larger and stronger than its prey and takes large bites, while the parasite is smaller than its host and takes small bites.

This part of the work includes a discussion of: (1) Parasitism and Other Forms of Life; (2) Types of Parasitic Relations; (3) Pathogenicity and Pathogenic Effects;

(4) Host and Organ Specificity; (5) Resistance and Immunity; (6) Effect of Parasitic Life on the Parasite; (7) Epizootology; (8) Geographical Distribution, and (9), a Historical Account. Directions are also given for the collection and preservation of parasites and diagnostic methods.

The life history of the parasite, means of control and treatment, wherever these subjects are known, is given for each parasitism and the frequent repetition of the word "unknown" under these various headings, is an ever recurrent reminder of how much investigational work in the field of veterinary parasitology yet remains to be done.

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Brucella Infections in Animals and Man. Methods of Laboratory Diagnosis. By L. Forest Huddleson, with an introduction by Ward Giltner. 108 pages. The Commonwealth Fund, New York, 1934. Price $2.00.

The monograph comprises seven chapters, as follows: The Genus Brucella; Methods of Isolating Brucella; The Pathology of Brucella Infections; Serological Methods of Determining Brucella Infections; Allergic Methods of Determining Brucella Infections; Methods of Determining Brucella Infection by Measuring the Opsono-Cytophagic Power of the Blood; Methods of Differentiating the Species of the Genus Brucella. The book contains a bibliography of 188 references to the literature, and a subject index; it is illustrated by 23 figures and seven tables.

This treatise gives to the clinician, the veterinarian and the laboratory worker, in a convenient form, acceptable laboratory methods that have been proved of value as aids in the diagnosis of brucellosis. The reviewer concurs in the opinion of Dr. Ward Giltner, as expressed in his introduction, that Huddleson's discussion of the subject will be very useful to the ever-increasing group of interested workers in the medical sciences, because it deals with a disease that belongs to the future, a disease that is not well understood by anyone, unless it be the specialist who has worked with it for a long time. The monograph deserves to be on the bookshelf of every veterinarian who has a pride in the literary output of the profession of his country.

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Practical Everyday Chemistry, How to Make What You Use; No Theory—Practical Modern Working Formulae for Making Hundreds of Products, by H. Bennett, F.A.I.C., Editor in Chief of the Chemical Formulary. 305 pages; published by The Chemical Publishing Co., New York, 1934. $2.00.

It would almost seem easier to tell what this book does not, than what it does contain. The reviewer has attempted without success, to think of a preparation used on the farm, in the household or in industry, one or more formulae for which are not included in this work. Probably just to make the work complete, a few, mercifully only a few, formulae for veterinary remedies are given. They do not amount to much; but in its field, adhesives; agricultural and garden specialties; lacquers, paints, varnishes, stains; cosmetics; emulsions; inks, crayons; leather, tanning, softening, dying, coating; lubricants; materials of construction; paper; photography; plating; polishes; plastics; cleaners and miscellaneous formulae—nothing appears to have been overlooked. The publisher appears not too enthusiastic, when he states:

"If you are thirsting for a knowledge of practical chemistry and are curious to know what are the secrets behind chemistry's magic veil; if you would like to know how to transform a few simple ingredients into cosmetics, beverages, adhesives, drugs, inks, lacquers, lubricants, tooth powder, polishes, soaps, waxes and hundreds of other useful things—then you are holding the 'key' in your hands now. All practical—no theory. This authoritative and standard work—the first modern work of its kind made available to the public, may start you on a fascinating hobby, profession or business of your own."

The chief chemist of the U. S. Naval Supply Base, Brooklyn, New York, perhaps exaggerated but little when he said of it:

"It tells how to make everything except love and little green apples."

Veterinary Military History of the United States, by L. A. Merillat and D. M. Campbell.

This work, now in the hands of the printer, is announced for early publication. The title, in some respects, seems likely to mislead, since the work is in reality a history of the veterinary profession of the United States, from the Revolutionary War until the present, and except for a very complete account of the Veterinary Service of the Army during the World War, it perhaps does not deal with military matters in greater proportion than does the average popular history of the United States.

The following chapter headings indicate the scope of the work:

Book I, Introduction.

Chapter I, The Era of Veterinary Medicine; II, Our Task; III, We, The Unready; IV, The Livestock Industry: Its Relation to National Defense; V, Horses and Mules; VI, The Cavalry Arm; VII, "Meet General Grant"; VIII, Indifference to Experience; IX, Defective Veterinary Service in the South African War Led to Revolutionary Changes; X, Horse Management Problems of the Veterinary Service.

Book II, 1792-1861.

XI, Early Army Veterinary Service; XII, The Original Army; XIII, Veterinary Service of Civilian Population; XIV, Veterinary Education and Literature.

Book III, 1861-1879.

XV, Army Veterinary Service During the Civil War; XVI, Changes in Army Veterinary Service Following the Civil War; XVII, Development of An American Veterinary Profession.

Book IV, 1879-1901.

XVIII, The Status of Army Veterinarians; XIX, Duties and Achievements of Army Veterinarians; XX, Attempts to Improve the Army Veterinary Service by Legislation; XXI, The Spanish-American and Philippine Wars; XXII, Quartermaster Veterinarians of 1898-1900; XXIII, Army Veterinarians During the '90s and Later; XXIV, Clinical Veterinary Medicine; XXV, The Private Veterinary Schools.

Book V, 1901-1916.

XXVI, Work of Army Veterinarians; XXVII, Efforts to Obtain Army Veterinary Legislation; XXVIII, State Veterinary Education; XXIX, Veterinary Periodicals; XXX, Organized Veterinary Medicine.

Book VI, 1916-1920.

XXXI, Delay and Incompetence in Organizing a Veterinary Service; XXXII, Organization of the Veterinary Service; XXXIII, Experiences of a General Veterinary Inspector; XXXIV, Cooperation with the Remount Services; XXXV, The Summer of 1917; XXXVI, The First 1,000 in Khaki; XXXVII, Consolidation of Gains; XXXVIII, New Policies and a New Director; XXXIX, Summer of 1918; XL, The Beginning of the End; XLI, Demobilization Gains Momentum, XLII, The Old Order Returns; XLIII, The Fifty-Year-Old Battle with Congress Resumed; XLIV, Veterinary Training Schools; XLV, Army Food Inspection; XLVI, Laboratory Service; XLVII, Curious Sequellae of "War Psychology"; XLVIII, Veterinary Service of the A. E. F., 1917-19; XLIX, Official Documents of the World War; XLX, List of Veterinary Officers.

Book VII, 1920-1935.

XLXI, Present Army Veterinary Corps; XLXII, Chronology of Veterinary Events.

The text gives convincing evidence of exhaustive, careful and impartial search of veterinary literature of the United States from its beginning until the present, and a list of more than 300 references will enable the reader to pursue almost any given subject further, or weigh the conclusions drawn by the authors, who have not hesitated to place their own interpretation upon the significance of events. The work includes chapters by Drs. F. H. Davis, C. J. Marshall, C. E. Cotton and J. P. Turner. A more extended review of this important publication will be given when the text is available, which it is stated will be soon.

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Die Kolik des Pferdes und ihre Behandlung (Colics of the Horse and Their Treatment), by Dr. Med. Vet. L. Ariess, Peissenberg (Oby.), Germany. 436 pages, published at Stuttgart, Germany, 1928.

Colic is not a specific disease but a collective name for a number of diseases of the abdomen which manifest themselves more or less under the same symptom complex. The author has set himself the task of collecting and sifting all the information pertaining to the above subject. He has striven to present a scholarly and critical work. He has accomplished his purpose in a commendable manner. The volume forms an excellent presentation of the subject. The monograph, however, is not a mere compilation of literature. In making the treatise practical in its application, Doctor Areiss has drawn upon his own knowledge and experience. In view of the renewed interest in this country in horses and mules as a source of motive power on the farm, the wealth of information contained in the pages

of this book should prove to be of practical value to the general pratitioner. Moreover, the perusal of the contents affords a welcome comparison of our methods of treatment with those in vogue in Europe.

The subjects covered include: Definition, technical terms, statistics, anatomy, physiology, pathology, causes, symptoms, diagnosis, rectal exploration, differential diagnosis, course of disease and causes of death, prognosis, general therapy, emergency slaughter and meat inspection, liability, insurance, quackery, special colic symptoms, special colic forms, colic in relation to disease, bibliography and index.

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The Internal Parasites of Domestic Animals, a Manual for Veterinary Surgeons, by Thomas W. M. Cameron, T.D., M.A. Ph.D., D.Sc., M.R.C.V.S., Research Professor of Parasitology, McGill University, Director of the Institute of Parasitology, MacDonald College, Canada. 292 pages, 144 illustrations; published by The MacMillan Company, New York, 1934. $4.00.

Professor Cameron, a recent accession to the American veterinary profession, is well qualified to prepare a text on this subject, particularly for students. His experience as a lecturer in helminthology at the London School of Hygiene and Tropical Medicine, at the University of Edinburgh, at the Royal (Dick) Veterinary College and in his present position has taught him the needs of students, both graduate and under-graduate, in the matter of instruction in protozoology and helminthology.

In the brief work in hand, he discusses only parasites of known economic importance or common occurence. His discussion is clear and suscinct and always to the point. An introductory chapter deals with the nomenclature of parasites and the history of parasitology. The parasites are discussed in the customary groups and subgroups. The final chapters treat of immunology, serology and technic. The illustrations are from microphotographs and drawings, and include many ingenious pictorial diagrams of the life cycles of different species in relation to host and habitat.

The work is perhaps better adapted to the student than to the practitioner, since the discussion of a given parasitism is not usually completed in a single place, but may be carried on; for example, under the general head of therapeutics. This arrangement, however, saves duplication and enables the author to include a more comprehensive discussion of the subject than would otherwise be possible in a book of this size.

The author's direct, pleasing style is illustrated by the following quotations:

Parasitism is the rule rather than the exception in wild animals; so much so, that a slight infection should be regarded as a normal rather than an abnormal condition. It is a curious paradox, however, that the more agricultural science advances, the more frequent must helminthic and protozal infections become and the more intense must be the disease and loss which they cause. . . .

Unfortunately, the parasitic worms, with a few exceptions, do not produce the spectacular and explosive symptoms of the great epizootic virus and bacterial diseases. The loss, however, is insidious and constant and is at least as great. There is seldom any fever and the usual symptoms are those of a slow and progressive debility. The farmer too often dismisses this as due to poor stock or "bad doers" and the true cause is often unsuspected. The fact, too, is often overlooked that these parasites facilitate the attacks of bacterial diseases and a slight bacterial infection combined with a moderate degree of infestation with worms—each in itself incapable of producing a serious condition—will, acting together, cause the death of the animal. This plurality of the causes of disease is too often overlooked in the teaching of medicine, although the practitioner learns by experience how common and how important it is. . . .

There is no doubt that the parasitic diseases, as a cause of loss to stock-owner and state, are at least as important as the bacterial and virus diseases and promise to become even more important in the future. . . .

On the whole, animal parasites have much more specific requirements than have bacteria, and most can develop only in certain species or a group of closely related species of hosts. . . .

The drugs used against parasites are legion; but the brilliant work of Hall in America has given a new value to most of them. A few and only a few are really of value against parasites. This work has revealed anthelmintic properties of a very high order in some new drugs. Those more important to the veterinary surgeon are carbon bisulphide, carbon tetrachloride, copper sulphate, arecoline hydrobromide, oil of chenopodium and male fern, but others are coming into use. . . .

In general, the reader will conclude that in matters of treatment, the author is a pessimist, even a therapeutic nihilist. He does not even mention, for example, the use of antimony against dirofilaria.

NOTICES OF JUDGMENT UNDER THE FOOD AND DRUGS ACT*

21510. Misbranding of V. S. Poultrytone. U. S. v. 11 Packages of V. S. Poultrytone. Default decree of condemnation, forfeiture, and destruction. (Federal Food Co., Fostoria, O.)

Examination of the drug product V. S. Poultrytone disclosed that it contained no ingredient or combination of ingredients capable of producing certain curative and therapeutic effects claimed in the labeling. The product would not aid egg production as claimed.

Analysis of a sample of the article by this department showed that it consisted essentially of calcium carbonate, magnesium sulphate, and small proportions of sulphur, quassia, and capsicum.

21514. Misbranding of Acme Stock Tone and Acme Poultry Tone. U. S. v. Eleven 6-Pound Packages of Acme Stock Tone, et al. Default decree of condemnation, forfeiture, and destruction. (Acme Stock Salt Co., Fostoria, Ohio.)

Examination of the drug products, Acme Stock Tone and Poultry Tone, disclosed that they contained no ingredients or combinations of ingredients capable of producing certain curative and therapeutic effects claimed in the labeling. It was further claimed in the labeling of the Poultry Tone that it would aid egg production, whereas it would not.

Analyses of samples of the articles by this department showed that the Acme Stock Tone consisted essentially of calcium carbonate, magnesium sulphate, ferrous sulphate, and smaller proportions of sulphur quassia, fenugreek seed, and nux vomica; and that the Acme Poultry Tone consisted essentially of calcium carbonate, magnesium sulphate, iron oxide, and small proportions of sulphur, quassia, and capsicum. Yeast and cod liver oil were not present in either article.

21519. Misbranding of Garvin's Remedies for Chickens and Human Use. U. S. v. 24 Small Bottles and 12 Pint Bottles of Garvin's Remedies for Chickens and Human Use. Default decree of condemnation and forfeiture. (Pest U Di Chemical Co., Chicago.)

Examination of the drug preparation involved in this case disclosed that the article contained no ingredient or combination of ingredients capable of producing certain curative and therapeutic effects claimed.

Analysis of a sample of the article by this department showed that it consisted essentially of boric acid (4.6 grams per 100 milliliters), potassium permanganate (3.6 grams per 100 milliliters), and water.

21531. Misbranding of Acme Medicated Stock Salt. U. S. v. Fifty 200-Pound Bags, et al., of Acme Medicated Stock Salt. Default decree of condemnation, forfeiture, and destruction. (Acme Stock Salt Co., Tiffin, Ohio.)

This case involved a drug product labeled to convey the impression that it consisted entirely of drugs, that it was iodized and yeastolized, and that it contained, among other listed ingredients, potassium iodide and yeast. Samples, when analyzed, were found to consist principally of common salt, no yeast nor potassium iodide being found.

Analysis of a sample of the article by this department showed that it consisted essentially of sodium chloride (97 per cent), calcium carbonate (1 per cent), and small proportions of sodium bicarbonate sulphur, copperas, and nux vomica. Potassium iodide and yeast were not present.

21535. Adulteration and Misbranding of Consolidated Stock and Poultry Compounds. U. S. v. Fourteen 3-Pound Packages of Consolidated Stock Compound, et al. Default decree of condemnation, forfeiture, and destruction. (Hutchison, Kan.)

This case involved products sold as stock and poultry conditioners and represented to contain yeast and cod-liver oil. Examination showed that the articles contained no ingredients or combinations of ingredients capable of producing certain curative and therapeutic effects claimed in the labeling. No yeast nor cod liver oil were in the samples of the products analyzed.

Analyses of samples of the articles by this department showed that the Consolidated Stock Compound consisted essentially of calcium carbonate, magnesium sulphate, ferrous sulphate, small proportions of sulphur, quassia, and fenugreek seed, and a trace of nux vomica; and that the Consolidated Poultry Compound consisted essentially of calcium carbonate, magnesium sulphate, iron oxide, and small proportions of sulphur, quassia, and capsicum. Yeast and cod-liver oil were not present in either articles.

21549. Misbranding of Chicko Tablets for White Diarrhea in Chicks, Chicko Tablets for Roup, Canker, Catarrh, Influenza and Sore-Head, and Chicko Powder for Cholera and Other Bowel Trouble in Poultry. U. S. v. 60¾ Dozen Packages of Chicko Tablets for White Diarrhea in Chicks, et al. Default decrees of condemnation, forfeiture, and destruction. (Redwood Laboratories, Inc., Redwood Falls, Minn.)

Examination of the drug products involved in these cases disclosed that they contained no ingredients or combinations of ingredients capable of producing certain curative and therapeutic effects claimed in the labeling.

Analyses of samples of the articles by this department showed that the Chicko Powder for Cholera and Other Bowel Trouble in Poultry consisted essentially of potassium, alum, sulphur, capsicum, and asafetida; and that the Chicko Tablets for White Diarrhea in Chicks consisted essentially of mercuric chloride, compounds of zinc, calcium, and sodium, including phenolsulphonates; and that the Chicko Tablets for Roup, Canker, Catarrh, Influenza and Sore-Head consisted essentially of compounds of sodium, potassium, and manganese, including a sulphate, and boric acid.

*From report of the Food and Drug Administration, United States Department of Agriculture.

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1. Chappel's Ken-L-Biskit is made with FRESH, RAW, RED MEAT, and many other highly nutritious foods.
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21579. Adulteration and misbranding of solution posterior pituitary. U. S. v. G. W. Carnrick Co. Plea of guilty. Fine, $100. (G. W. Carnrick Co., Newark, N. J.)

This case was based on an interstate shipment of solution posterior pituitary which was represented to be of pharmacopoeial standard but which was found to possess approximately one-fourth the minimum potency of solution posterior pituitary as defined in the United States Pharmacopoeia, Tenth Revision.

21582. Misbranding of Super Culture Hylactic Yeast Feed. U. S. v. 104 Bags of Super Culture Hylactic Yeast Feed. Consent decree of condemnation and forfeiture. Product released under bond to be relabeled. (Super Culture Sales Co., Sioux City, Ia.)

This case involved a shipment of a product intended for use as a stock conditioner. Examination showed that the article would not increase the feeding value of common grains 20 to 30 per cent as represented in the circular, would not aid in fattening livestock, would not aid in the production of beef, and would not stimulate milk production as claimed. The article contained no ingredient or combination of ingredients capable of producinig certain curative and therapeutic effects claimed in the labeling.

Analysis showed it consisted essentially of plant material including wheat and yeast and inorganic material including sodium chloride, 5 per cent; sodium bicarbonate, 3.3 per cent, and iron oxide, 1.3 per cent.

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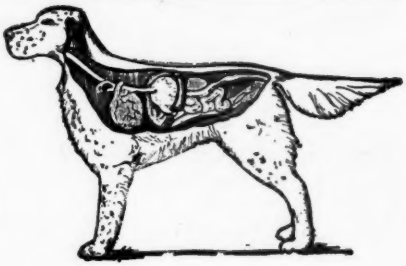

From experiments on living animals have come two sensational discoveries—bearing the highest commendation and solving two problems that have long vexed those who feed dogs. Announcement of these last month found veterinarians alive to the importance and eager to try the Food that contained them.

1 Stabilized Vitamines

A new patented process, approved by the Food Committee of the American Medical Association, now seals vitamines A, D and G with a protective coating that preserves their potency almost indefinitely. No need to tell you of the essential part vitamines have in canine nutrition—nor how quickly they usually oxodize in a dry food. The new process now enables you to know that the vitamine strength is adequate WHEN GAINES FOOD IS FED.

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Almost magically these enzymes split starch cells in the presence of moisture—liquefying them—taking the place, as it were, of the ptyalin lacking in canine saliva. This removes one of the big difficulties in feeding dogs—how to give them the benefits of cereals, vegetables and other starchy foods without danger of skin troubles, loose bowels and the like.

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Hundreds of veterinarians in the past year have investigated Gaines Foods—the granular Meat and Milk Meal and the hardened Krunchon. Most of them have found them worthy of their professional recommendation; and many have built up profitable side-lines by selling them to their clients. May we send you full details—and samples? Please mention VETERINARY MEDICINE when writing.

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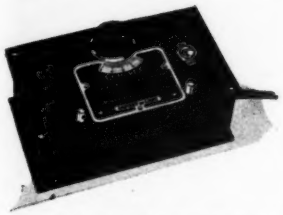

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21581. Adulteration and misbranding of Nu-Vita Yeast. U. S. v. 20 Sacks of Nu-Vita Yeast for Livestock and Poultry. Default decree of forfeiture and destruction. (Geo. D. Miller Co., Waterloo, Ia.)

This case involved a product labeled to convey the impression that it consisted essentially of yeast. Examination showed that the article consisted largely of corn meal, with a small amount of barley and an unimportant proportion of yeast present. The article would not make feed more available in stock and poultry production as claimed, and contained no ingredient or combination of ingredients capable of producing certain curative and therapeutic effects claimed in the labeling.

Analysis of a sample of the article by this department showed that it consisted essentially of corn meal, with small proportions of a barley product and yeast. The yeast constituted approximately 1 per cent of the product.

21597. Misbranding of Iodine Crumble. U. S. v. Twenty-three 1-Pound Boxes and Nine 5-Pound Boxes of Iodiine Crumble. Default decree of condemnation, forfeiture, and destruction. (Pacific Laboratories, Inc., Los Angeles, Calif.)

This case involved a drug preparation known as Iodine Crumble, labeled to convey the impression that it was valuable as a source of iodine. Analysis showed that the article contained no uncombined iodine, that its principal active ingredients were other drugs, and that it contained a materially greater percent-

FISTONE

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Use it, as many practitioners have learned to do, in catarrhal endometritis. It is near specific. Fistone is equally efficacious in localized suppurative infections encountered in equine practice, such as Fistula of the Withers, and of poll, and in quittor.

Fistone is administered with the feed, is inexpensive and within the reach of all veterinarians.

The Fistone and Appliance Company,
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Trial Order—one dozen boxes (once only)	$ 8.00
Regular price—one dozen boxes	10.00
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CATHARTICS *for* HORSES

No drugs should be more carefully chosen nor more cautiously employed than purgatives in horses.—Roscoe R. Bell.

The author of the above remark was editor of the American Veterinary Review, professor of therapeutics in the American Veterinary College, and a distinguished Brooklyn practitioner.

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ALOES CAPSULE (EQUINE), containing 9 drams of Barbadoes aloe in a quick-dissolving coating. —Safe and certain

1 doz. ..... $2.25 12, 1 doz. $22.50

ALOES CAPSULE (EQUINE), No. 2, containing aloes, barium chloride, nux vomica, and jalap. —A drastic purgative.

1 doz. ..... $1.75 6, 1 doz. ..... $10.00 12, 1 doz. $18.90

CAL-ALOIN BOLUS, containing aloin, calomel, capsicum, nux vomica.—A safe general purpose purgative, permenantly pliable.

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PURGATIVE CAPSULES (EQUINE), containing aloin, oleoresin ginger, calomel, strychnine,—purgative, nervine, cholagogue, stomachic for dormant bowels and impactions.

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BARIUM-ALOES COMPOUND, containing barium chloride (90 gr.) aloes (40 gr.), belladonna leaves and glycerine, per fluid ounce.—Quick-acting, drastic, for forage poisoning and non-febrile impactions.

Pint ..... $0.90; gallon $6.00

PURGATIVE ELIXIR, containing aloin, barium chloridemandrake, glycerine.—An active cathartic in horses, ruminants, and swine.

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PURGATIVE TABLETS (EQUINE), each containing aloin (60 gr.), calomel (15 gr.) strychnine (⅛ gr.),

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Tonamine builds up the strength of convalescent animals and undernourished puppies. Restores the appetite of run-down small animals. Successfully offers Vitamins B, G and D as a supplement to regular diet. Also is rich in food value and good for distemper.
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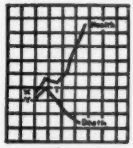
Chart at right shows what a daily dose of only 3 cc. of Tonamine will do for a rat whose system has been depleted of Vitamin B Complex. Rat X fed Tonamine in addition to Vitamin B free food. Rat Y fed Vitamin B free food only. Write for free booklet!



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age of active (and potentially harmful) ingredients than was declared on the label. The label also bore unwarranted curative and therapeutic claims.

Analysis of a sample of the article by this department showed that it consisted essentially of calcium carbonate, small proportions of penolphthalein, sulphur, and a mercury compound (mercury 1.3 per cent), and iodine in a combined form. No free iodine was present.

It was alleged in the libel that the article was misbranded in that the name "Iodine Crumble," and the statement on the package, "Active ingredient .30 per cent. Inert ingredients 99.70 per cent," were false and misleading, in view of the composition of the product. Misbranding was alleged for the further reason that the statement on the package, "For round (ascardia) and tape worms in poultry," was false and fraudulent.

21592. Adulteration and misbranding of tincture of aconite root, fluidextract of ergot, and fluidextract of belladonna leaves. U. S. v. Standard Pharmaceutical Corporation. Plea of guilty. Fine, $40 and costs. (Standard Pharmaceutical Corp., Baltimore.)

This case was based on interstate shipments of tincture of aconite root, fluidextract of ergot, and fluidextract of belladonna leaves, which were represented to be pharmacopoeial products but which fell below the standard laid down in the United States Pharmacopoeia for such products.

Analyses of samples of the articles by this

Specific Against . . .

HEARTWORM INFESTATION of Dogs

(*Dicrofilaria Immitis*)

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"Dejem"

CANINE DISTEMPER COMPOUND

"Dejem" is decidedly beneficial to dogs with DISTEMPER and also controls the severe sickness following inoculations.

"Dejem" 16 oz. size, 1 bot. .....$ 2.75
3 bot. .....$6.75, 6 bot. $12.00

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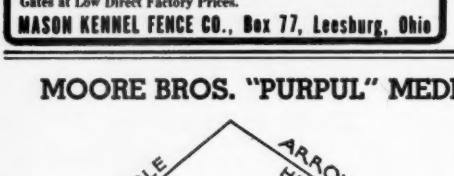
MOORE BROS. "PURPUL" MEDICATED WAX TEAT DIALATORS



Note the Needle Point and Arrow Head. Each Dilator re-inforced with eight small sterilized threads equally distributed. Adds to strength, makes them easier to insert and prevents the Medicated Wax from separating and flaking off. No wire re-inforcements. Not packed in grease.

Length	Per 100	Per 1,000
2¼ in. Regular	$0.75	$5.00 Postpaid
2¼ in. Thick	1.00	7.75 Postpaid
4 in. Regular	1.00	7.75 Postpaid
4 in. Thick	1.25	8.25 Postpaid

THE MOORE BROS. CORP., DEPT. V, ALBANY, NEW YORK

department showed that the tincture of aconite root possessed approximately one-third the potency required by the United States Pharmacopoeia, that the fluidextract of ergot was less than one-third as potent as required by the pharmacopoeia; and that the fluidextract of belladonna leaves contained 8 per cent more alkaloid than the maximum permitted by the pharmacopoeia.

21578. Adulteration and misbranding of tincture digitalis. U. S. v. Elmira Drug & Chemical Co. Plea of guilty. Fine, $600. (Elmira, N. Y.)

This case was based on an interstate shipment of tincture digitalis represented to be of pharmacopoeial standard, which was found to

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for Heart Worms (Canine Filariasis). An isotomic double salt of Antimony in solution ready for intravenous use.

Sold Through the Veterinary Profession Only.

2cc Test Dose	$0.20 ea.;	six for	$1.00
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SAN ANTONIO
TEXAS

have a potency of approximately 30 per cent of that prescribed by the United States Pharmacopoeia for tincture of digitalis. The article contained much more alcohol than was declared on the label.

22001. Misbranding of Sal-Tonik. U. S. v. Thirty-two 50-Pound Blocks of Sal-Tonik, et al. Default decrees of condemnation, forfeiture and destruction. (Guarantee Veterinary Remedy Co., Sioux City, Ia.)

This case involved various shipments of Sal-Tonik, the labels of which contained unwarranted curative and therapeutic claims.

Analysis of a sample of the article by this department showed that it consisted essentially of 87.8 per cent of sodium chloride, 4.2 per cent calcium carbonate, and small proportions of sulphur, paraffin, an iron compound, and sulphates.

It was alleged in the libels that the article was misbranded in that certain statements regarding its curative and therapeutic effects, appearing on the labels, were false and fraudulent, since the article contained no ingredient or combination of ingredients capable of producing the effects claimed.

21807. Misbranding of Schultz Liquid-Tone. U. S. v. Ferdinand Henry Schultz (Schultz Chemical Co., Council Bluffs, Ia.) Plea of guilty. Fine, $200 and costs.

Examination of the drug preparation, Schultz Liquid-Tone, disclosed that it contained no ingredient or combination of ingredients capable of producing certain curative and therapeutic effects claimed in the labeling.

Essential Equipment

for Modern Veterinary Surgery Large Animal Practice and Small Animal Clinic

NATIONAL "Twin Control" Cautery for 110 V. 50-60 Cycle A.C. No. V 35 with "Trigger" Handle and 3 tips .....$33.50 SEE YOUR DEALER. . . . Write us for additional information.

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A product you can safely recommend, and one that will bring you commendation for having recommended it.

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EASY TO GIVE
LIQUID—FULL DOSAGE
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Thick walled shell. Pliable. Non-collapsible. Not brittle in coldest weather. Leak proof!

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TORPEDO BOT CAPSULES
(Liquid carbon disulphide)

GREEN Color. LIQUID contents recommended by U. S. Gov't as 99.3% efficient for bots.

25—No. 6 (6 dram.).....$2.75; 100 $10.00
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Less 10%—and 2% for cash.

TORPEDO STRONGYLI CAPSULES
(Liquid carbon tetrachloride)

WINE color. Best general-purpose equine anthelmintic. For strongyles and roundworms, etc. Safe!

25—6 dram. $2.75; 100 $10.00
Less 10%—and 2% for cash.

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Sales Manager Wanted by veterinary supply house. Address No. 121, care of VETERINARY MEDICINE.

FOR SALE: Oster clipper with plucking, shaving and clipping heads, oil, grease, brush, etc., packed in leather-covered carrying case. Absolutely brand new; $49.90. Made to sell for $63.00. Address No. 122, care of VETERINARY MEDICINE.

Analysis of a sample of the article by this department showed that it consisted essentially of small proportions of copper sulphate, sodium thiosulphate, potassium hydroxide, carbonates, phenols, glycerin, anise oil, and water colored with caramel.

It was alleged in the information that the article was misbranded in that certain statements, designs, and devices regarding the curative and therapeutic effects of the article, appearing on the label of the drum containing the article, falsely and fraudulently represented that it was effective as a treatment for sick hogs; effective as a preventive treatment against disease; effective as a preventive treatment of germ diseases in brood sows; effective as a treatment following vaccination to prevent any breaks on account of lowered vitality in pigs; effective as a treatment following vaccination to put stock hogs in good shape; and effective as a treatment for necro and flu.

Frank Phillips, a 1934 graduate of the Ontario Veterinary College, was married on July 19, 1934, to Miss Velma Black, daughter of Rev. and Mrs. G. O. Black of Paddockswood, Saskatchewan. With his bride, Doctor Phillips sailed for Shanghai on August 4th, and immediately upon his arrival in China commenced duties as veterinarian and director of the Shanghai Dairy Farms. Dr. Frank Phillips is the son of Dr. J. C. Phillips (Ont. '21), Edmonton, Alberta.

According to a horse census recently completed there are, in New York City, 22,156 horses, of which 8,575 are in Brooklyn, 1,968 in Queens. There are 406 blacksmith shops and 1,928 stables in the city. The majority of the horses are used by express and milk companies; 10% of them are saddle horses. The number of horses in New York City has been stationary for some years. Director Blauvelt of the Bureau of Sanitation of the Health Department, who took the census, does not look for a material change in the number of horses in the city within the next few years.

The annual meeting of the Illinois State Veterinary Medical Association will be held on February 19-20, 1935, at the Leland Hotel, Springfield, Illinois. For further information concerning the meeting, address Dr. C. C. Hastings, Williamsville, secretary.

A Short Course for Graduate Veterinarians will be held at the School of Veterinary Medicine, Auburn, Alabama, February 4th to 9th, 1935. On February 8th the Alabama State Veterinary Medical Association will hold its annual session.

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Bernard B. Glover, 55, Lexington, Virginia, died suddenly recently from a heart attack. Doctor Glover was graduated from the Ontario Veterinary College in 1908 and has practiced in Lexington since that time. He had twice served as president of the Virginia Veterinary Medical Association. He is survived by his widow, three sons and two daughters.

Patrick Burns, 75, died at his home in New York City some weeks ago. Doctor Burns was graduated from the New York College of Veterinary Surgeons in 1888 and had practiced in New York for 46 years. He is survived by his widow and a sister.

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Major Frank C. Hershberger is relieved from duty at Ft. Sill, Okla., effective at such time as will enable him to proceed to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about February 26, 1935, for the Philippine Department.

The appointment and assignment of the following named second lieutenants Veterinary Corps Reserve, as second lieutenants in the Veterinary Corps, Regular Army, with rank from December 1, 1934, are announced:

James Bernard Nichols, Fort Snelling, Minn.
Albert Arthur Roby, Jr., Apopka, Fla.
Andrew Jesse Sirilo, Salt Lake City, Utah.
Daniel Stevens Stevenson, Camden, N. J.
Ray Swartley Hunsberger, Middletown, N.Y.
William Francis Collins, Fredericksburg, Ia.

Lieutenant Nichols will continue on duty with the Civilian Conservation Corps at his present station. Each of the other officers named above, except Lieut. Sirilo, were assigned to Carlisle Barracks, Pa., and report to the commandant Medical Field Service School not later than December 29, 1934.

Veterinary Reserve Corps

Promotions: McKim, Orville Ernest, to Lt. Col., 425 Boston Post Rd., Port Chester, N. Y. Hartke, George Bernard, to Major, 802 Findlay St., Cincinnati, Ohio.

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